

Appendix A

Computer Programs for Data Development and Statistical Analysis

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1. SQL program to obtain distinct Township/Range/Section coordinates from the Well Inventory Data Base where sampling was conducted by DPR and detections were confirmed positive and due to non-point source applications.

```
rem 1-13-99
rem dpr99.sql creates tables of positive well samples
rem from the well inventory database where dprdatab
rem is table of distinct mtrs to use in sect99anal.sql program
rem Table is all status='P' and porn='N' data from DPR, study 130 status=P,and
rem 1 section with norflurazon 5 total residues in well and 1 Ciba well
rem
```

```
drop table dpr99;
create table dpr99 as select
  co, mtrs
  from widb
  where (agency=4323 and status='P' and porn='N') or
  (apfile='0130' and status='P') or mtrs='M21S27E05'
  or (apfile='CG01' and status='P');
```

```
select count(*) from dpr99;
select count(distinct mtrs) from dpr99;
```

```
drop table dpr99dat;
create table dpr99dat as select
  distinct mtrs, co from dpr99;
select count(*) from dpr99dat;
```

```
exit
```

2. SQL program to link the T/R/S coordinates for sections with pesticide detections to a data base that contains the soil muids in sections and then to extract the data from the composition and layer NRCS data tables for each muid.

2a. Processing of data from Composition Table

REM

REM sect99comp.sql 04-20-99 prior to this analysis dpr99dat table was
REM made as an accumulation of positive sections from
REM DPR data where concentration >0, Status='P', Porn='N'
REM see DPRDATA.sql and newsect97.sql
REM excluded are DBCP, diaznion, monuron,
REM trifluralin, xylene and hexazinone (too early for this one)
REM Updated comp and layer tables for soil data were obtained from
REM the NRCS in the late April of 1999 and tables were named
REM COMP99 and LAYER99 - also corrections were made to data prior to input
REM Table MUID97B created from MUID97 to change name of msectno to mtrs
REM Table muid97c created to update muid97b. Colusa updated to add 'M' to mtrs
REM

REM

REM create table sect99anal where mtrs from dpr99dat table
REM is used to make a smaller data set from MUID table
REM

```
spool sect99
drop table sect99anal;
create table sect99anal
as
select b.mtrs, a.muid, b.co
from muid97c a, dpr99dat b
where upper(a.mtrs) = upper(b.mtrs);
```

REM

REM sect99comp.sql
REM Create a table with a smaller number of records than the
REM original COMP99 table using the sect99anal table
REM

```
drop table sect99comp;
create table sect99comp as
select
  comp99.ssaid, comp99.muid, comp99.seqnum, comp99.compct, slopel, slopeh,
  anfflood, anfflodur, watdepl, watdeph, wtkind, wtbeg, wtend, pnddepl,
  pnddeph, pnddur, rockdepl, rockdeph, rockhard, pandepl, pandeph, panhard,
  hydgrp, drainage, hydric
from comp99
where upper(comp99.muid) in (select distinct upper(sect99anal.muid)
from sect99anal);
```

REM Make all muid characters upper case

```
update sect99comp
set muid = upper(muid);
```

REM Create a field that consists of two other fields. This new
REM key field will be used to join to layr96.

```
REM alter table sect99comp96 add (muidkey varchar2(10));  
REM update sect99comp96  
REM set muidkey = muid || seqnum;
```

```
REM Create an index to speed the join up.  
REM create index sect99comp_muidkey on sect99comp96 (muidkey);
```

```
REM  
REM sect99com99.sql  
REM Apply comp data to all muids in SECTION99 table
```

```
drop table sect99com99;  
create table sect99com99 tablespace users  
pctused 95 pctfree 5 storage (initial 4m next 1m pctincrease 0)  
as  
select  
mtrs, co, ssaid, sect99anal.muid, seqnum, compppt,  
slopel, slopeh, anflodur, anflodur, watdepl, watdeph,  
wtkind, pnddepl, pnddeph, pnddur, rockdepl, rockdeph, rockhard,  
pandep, pandeph, panhard, hydgrp, drainage, hydric  
from sect99comp, sect99anal  
where sect99comp.muid(+) = sect99anal.muid;
```

```
rem create index sect99comlay_sectno on sect99comlay (mtrs);  
select count(*) from sect99com99;  
spool off
```

```
REM  
REM sect99comspool.sql  
REM
```

```
set null .;  
set heading OFF;  
set feedback OFF;  
set pagesize 0;  
set linesize 330;  
set term off;
```

```
spool sect99comp  
select mtrs||'|'||co||'|'||  
decode(muid,null,'.',muid)||'|'||  
decode(seqnum,null,'.',seqnum)||'|'||  
decode(comppct,null,'.',comppct)||'|'||  
decode(slopel,null,'.',slopel)||'|'||  
decode(slopeh,null,'.',slopeh)||'|'||  
decode(anflodur,null,'.',anflodur)||'|'||  
decode(anflodur,null,'.',anflodur)||'|'||  
decode(watdepl,null,'.',watdepl)||'|'||  
decode(watdeph,null,'.',watdeph)||'|'||  
decode(wtkind,null,'.',wtkind)||'|'||  
decode(rockdepl,null,'.',rockdepl)||'|'||  
decode(rockdeph,null,'.',rockdeph)||'|'||
```

```

decode(rockhard,null,',',rockhard)||'|'
decode(pandep1,null,',',pandep1)||'|'
decode(pandeph,null,',',pandeph)||'|'
decode(panhard,null,',',panhard)||'|'
decode(hydgrp,null,',',hydgrp)||'|'
decode(drainage,null,',',drainage)||'|'
decode(hydric,null,',',hydric)
from sect99com99
  order by mtrs;
spool off

```

2b. Processing of data from Layer Table

REM

REM sectlayer99.sql 4-20-99 prior to this analysis dpr99dat table was
 REM made as an accumulation of positive sections from
 REM DPR data where concentration >0, Status='P', Porn='N'
 REM see DPRDATA.sql and newsect97.sql
 REM excluded are DBCP, diaznion, monuron,
 REM trifluralin, xylene and hexazinone (too early for this one)
 REM Updated comp and layer tables for soil data were obtained from
 REM the NRCS in the late april of 1999 and tables were named
 REM COMP99 and LAYER99 - also corrections were made to data prior to input
 REM Table MUID97B created from MUID97 to change name of msectno to mtrs
 REM Table muid97c created to update muid97b. Colusa updated to add 'M' to mtrs
 REM

REM

REM create table anal99 where mtrs from dpr99dat table
 REM is used to make a smaller data set from MUID table
 REM

```

spool sect99
drop table sect99anal;
create table sect99anal
  as
select b.mtrs, a.muid, b.co
from muid97c a, dpr99dat b
where upper(a.mtrs) = upper(b.mtrs);

```

REM

REM sect99layer.sql
 REM Create a table with a smaller number of records than the
 REM original LAYER99 table using the SECT99ANAL table
 REM

```

drop table sect99layer;
create table sect99layer as
  select
    ssaïd, layer99.muid, layer99.seqnum, layernum, laydepl,
    laydeph, inch10l, inch10h, inch3l, inch3h,
    no4l, no4h, no10l, no10h, no40l, no40h,
    no200l, no200h, clayl, clayh, awcl, awch, bdl, bdh,
    oml, omh, phl, phh, salinl, salinh, cecl, cech,
    perml, permh, shrinksw

```

```
from layer99
where upper(layer99.muid) in (select distinct upper(sect99anal.muid)
from sect99anal);
```

REM Make all muid characters upper case

```
update sect99layer
set muid = upper(muid);
```

REM

REM sect99layer99.sql

REM Apply combined data to all muids in SECTION99 table

```
drop table sect99layer99;
create table sect99layer99 tablespace users
pctused 95 pctfree 5 storage (initial 4m next 1m pctincrease 0)
as
select
mtrs, co, ssaid, sect99anal.muid, seqnum, layernum,
laydepl, laydeph, inch10l, inch10h, inch3l, inch3h,
no4l, no4h, no10l, no10h, no40l, no40h, no200l, no200h,
clayl, clayh, awcl, awch, bdl, bdh, oml, omh, salinl,
salinh, cecl, cech, perml, permh, shrinksw
from sect99layer, sect99anal
where sect99layer.muid(+) = sect99anal.muid;
```

```
select count(*) from sect99layer99;
spool off
```

REM

REM sectlayer99.sql

REM

```
set null .;
set heading OFF;
set feedback OFF;
set pagesize 0;
set linesize 330;
set term off;
```

spool sectlayer99

```
select mtrs||' '||co||' '||
decode(muid,null,'.',muid)||' '||
decode(seqnum,null,'.',seqnum)||' '||
decode(layernum,null,'.',layernum)||' '||
decode(laydepl,null,'.',laydepl)||' '||
decode(laydeph,null,'.',laydeph)||' '||
decode(inch10l,null,'.',inch10l)||' '||
decode(inch10h,null,'.',inch10h)||' '||
decode(inch3l,null,'.',inch3l)||' '||
decode(inch3h,null,'.',inch3h)||' '||
decode(no4l,null,'.',no4l)||' '||
decode(no4h,null,'.',no4h)||' '||
decode(no10l,null,'.',no10l)||' '||
decode(no10h,null,'.',no10h)||' '||
```

```
decode(no40l,null,',no40l)||'|'  
decode(no40h,null,',no40h)||'|'  
decode(no200l,null,',no200l)||'|'  
decode(no200h,null,',no200h)||'|'  
decode(clayl,null,',clayl)||'|'  
decode(clayh,null,',clayh)||'|'  
decode(awcl,null,',awcl)||'|'  
decode(awch,null,',awch)||'|'  
decode(bdl,null,',bdl)||'|'  
decode(bdh,null,',bdh)||'|'  
decode(oml,null,',oml)||'|'  
decode(omh,null,',omh)||'|'  
decode(salinl,null,',salinl)||'|'  
decode(salinh,null,',salinh)||'|'  
decode(cecl,null,',cecl)||'|'  
decode(cech,null,',cech)||'|'  
decode(perml,null,',perml)||'|'  
decode(permh,null,',permh)||'|'  
decode(shrinksw,null,',shrinksw)  
from sect99layer99  
  order by mtrs;  
spool off
```

3. SAS programs for processing data from COMP and LAYER data tables for MUIDs identified in each Township/Range/Section.

3a. Processing of data from the Composition table.

```
/*rcomp99.sas 4-22-99*/  
/*Finalized COMP and LAYER tables were obtained from NRCS*/  
/*in October 1997. Some of the data had been changed which*/  
/*resulted in slight changes for averaged section soil data*/  
/*Owing to the differences it was concluded that the vulnerability*/  
/*analyses would have to be done again starting with the clustering*/  
/*of soil data. Positive sections were determined as of 1-13-1999 and*/  
/*for this analysis only DPR data for sections designated as PORN='N'*/  
/*(Nonpoint source) and STATUS='P' was used. One section from a Ciba*/  
/*was used. This program takes data which was spooled from Oracle tables*/  
/*and averages variables where low and high values were determined*/  
/*or assigns a numeric value to variables with descriptors such as*/  
/*low, medium, and high. These data will be censored using*/  
/*the slopeh <= 15% cutoff as determined from previous analyses*/
```

```
options ls=80 ps=60;  
title1 'Cluster analysis of data from the Well Inventory as of:';  
title2 'January 14, 1999';
```

```
data c;infile 'd:\epa\soiltest\cluster99\apr99\comp99.dat' dlm='|' lrecl=330;  
input mtrs :$9. co muid $ seqnum compct slope1 slopeh  
anflood $ anflodur :$11. watdepl watdeph wtkind $ rockdepl rockdeph  
rockhard $ pandepl pandeph panhard $ hydgrp $ drainage $ hydric $;
```

```
/*Soil with slopeh<=15 keep*/  
data c1;set c;if slopeh<=15;
```

```
/*assignment of numerical values to character data*/  
data c2;set c1;
```

```
/*assignment of drainage values*/  
drain=.;  
if drainage='VP' then drain=0;  
if drainage='P' then drain=1;if drainage='SP' then drain=2;  
if drainage='MW' then drain=3;if drainage='W,MW' then drain=3.5;  
if drainage='W' then drain=4;if drainage='W,SE' then drain=4.5;  
if drainage='SE' then drain=5;if drainage='SE,E' then drain=5.5;  
if drainage='E' then drain=6;if drainage='P,E' then drain=3.5;
```

```
/*assignment of hydraulic group variables-must assign A-D etc*/  
/*try 2 groups well-drained vs not so welldrained*/  
hyd=.;  
if hydgrp='A'|hydgrp='B' then hyd=0;  
if hydgrp='C'|hydgrp='D'|hydgrp='C/D' then hyd=1;
```

```
/*assignment of hardpan values*/  
pan=0;  
if panhard='THICK'|panhard='THIN' then pan=1;
```



```

/*assignment of water table values*/
wattab=0;
if wtkind='APPAR'|wtkind='PERCH' then wattab=1;

/*assignment of annual flooding values-changed to 0-1 */
flood=.;
if anflod='NONE'|anflod='RARE' then flood=0;
if anflod='COMM'|anflod='FREQ'|anflod='OCCAS' then flood=1;

/*assignment of annual flood duration values*/
/*fldur=0;*/
/*if anflodur='BRIEF' then fldur=1;*/
/*if anflodur='VERY BRIEF' then fldur=2;*/
/*if anflodur='LONG' then fldur=3;*/
/*if anflodur='VERY LONG' then fldur=4;*/

/*assignment of rockhard*/
bedrock=0;
if rockhard='HARD'|rockhard='SOFT' then bedrock=1;

/*assignment of hydric*/
watsoil=0;
if hydric='Y' then watsoil=1;

/*Processing of low and high data*/
slope=(slopel+slopeh)/2;

data c3;set c2;if rockdepl ne .;
pslope=compct*slope;
pwatsoil=compct*watsoil;
pbedrock=compct*bedrock;
pflood=compct*flood;
ppan=compct*pan;
pdrain=compct*drain;
pwattab=compct*wattab;
phyd=compct*hyd;

proc sort;by co mtrs muid;
proc means mean sum noprint;by co mtrs muid;
var compct pslope pwatsoil pbedrock pflood ppan pdrain pwattab phyd;
output out=c4 sum=spct sslope swatsoil sbedrock sflood span sdrain swattab shyd;

data c5;set c4;
slope=sslope/spct;
watsoil=swatsoil/spct;
bedrock=sbedrock/spct;
flood=sflood/spct;
pan=span/spct;
drain=sdrain/spct;
wattab=swattab/spct;
hyd=shyd/spct;

proc sort;by co mtrs;
proc means mean noprint;by co mtrs;
var slope watsoil bedrock dra in wattab flood pan hyd;

```

```
output out=c6 mean=slope watsoil bedrock drain wattab flood pan hyd;  
proc print;
```

```
/*composition data output to data set*/  
data _null_;set c6;  
filename so 'd:\epa\soiltest\cluster99\apr99\rcomp99.dat';  
file so noprint;  
put co 1-2 mtrs 4-12 drain 14-17 .2 wattab 19-22 .2  
flood 24-27 .2 pan 29-33 .2 hyd 35-38 .2 slope 40-44 .2  
watsoil 46-49 .2 bedrock 51-54 .2;  
run;
```

3b. Processing data from the Layer table.

```
/*rlayer99.sas 4-23-99*/
/*Finalized COMP and LAYER tables were obtained from NRCS*/
/*in April 1999. Some of the data had been changed which*/
/*resulted in slight changes for averaged section soil data*/
/*Owing to the differences it was concluded that the vulnerability*/
/*analyses would have to be done again starting with the clustering*/
/*of soil data. Positive sections were determined as of 1-13-1999 and*/
/*for this analysis only DPR data for sections designated as PORN='N'*/
/*(Nonpoint source) and STATUS='P' was used. One section from a Ciba*/
/*was used. This program takes data which was spooled from Oracle tables*/
/*and averages variables where low and high values were determined*/
/*or assigns a numeric value to variables with descriptors such as*/
/*low, medium, and high. These data will be censored using*/
/*the slopeh <= 15% cutoff as determined from previous analyses*/

options ls=80 ps=60;
title1 'Cluster analysis of data from the Well Inventory as of: ';
title2 'January 14, 1999';

/*infile composition data for merging into layer data*/
data c;infile 'd:\epa\soiltest\cluster99\apr99\comp99.dat' dlm='|' lrecl=330;
input mtrs :$9. co muid $ seqnum compct slopeh slopeh
anflood $ anfloodur :$11. watdepl watdeph wtkind $ rockdepl rockdeph
rockhard $ pandepl pandeph panhard $ hydgrp $ drainage $ hydric $;

data c1;set c;if rockdepl ne .;

/*Soil with slopeh<=15 keep*/
data c2;set c1;if slopeh<=15;

data c3;set c2; keep mtrs co muid seqnum compct;
proc sort;by mtrs muid seqnum;

/*infile layer data*/
data l;infile 'd:\epa\soiltest\cluster99\apr99\layer99.dat' dlm='|' lrecl=330;
input mtrs :$9. co muid $ seqnum layernum laydepl laydeph inch10l inch10h
inch3l inch3h no4l no4h no10l no10h no40l no40h no200l no200h clayl
clayh awcl awch bdl bdh oml omh salinl salinh cecl cech perml permh shswell :$9.;

proc sort;by mtrs muid seqnum;

/*merge comp and layer data*/
data all;merge l c3 ;by mtrs muid seqnum;

/*cull out values where compct is missing*/
data all1;set all;if compct ne .;

/*assignment of numerical values to character data*/
data all2;set all1;
shrink=. ;if shswell='LOW' then shrink=0;
if shswell='MODERATE' then shrink=1;if shswell='HIGH' then shrink=2;

inch10=(inch10l+inch10h)/2;
```

```

inch3=(inch3l+inch3h)/2;
no4=(no4l+no4h)/2;
no10=(no10l+no10h)/2;
no40=(no40l+no40h)/2;
no200=(no200l+no200h)/2;
clay=(clayl+clayh)/2;
awc=(awcl+awch)/2;
bd=(bdl+bdh)/2;
om=(oml+omh)/2;
salin=(salinl+salinh)/2;
cec=(cecl+cech)/2;
perm=(perml+permh)/2;
laydepth=(laydepl+laydeph)/2;

```

```

data all3;set all2;
pinch10=compct*inch10;
pinch3=compct*inch3;
pno4=compct*no4;
pno10=compct*no10;
pno40=compct*no40;
pno200=compct*no200;
pclay=compct*clay;
pawc=compct*awc;
pbd=compct*bd;
pom=compct*om;
psalin=compct*salin;
pcec=compct*cec;
pperm=compct*perm;
playdep=compct*laydepth;
pshrink=compct*shrink;

```

```

/*sum across sequence numbers*/
proc sort;by co mtrs muid layernum;
proc means mean sum noprint;by co mtrs muid layernum;
var compct pinch10 pinch3 pno4 pno10 pno40 pno200 pclay pawc
pbd pom psalin pcec pperm playdep pshrink;
output out=ls sum=spct sinch10 sinch3 sno4 sno10 sno40 sno200
sclay sawc sbd som ssalin scec sperm slaydep sshrink;

```

```

data ls1;set ls;
inch10=sinch10/spct;
inch3=sinch3/spct;
no4=sno4/spct;
no10=sno10/spct;
no40=sno40/spct;
no200=sno200/spct;
clay=sclay/spct;
awc=sawc/spct;
bd=sbd/spct;
om=som/spct;
salin=ssalin/spct;
cec=scec/spct;
perm=sperm/spct;
laydep=slaydep/spct;
shrink=sshink/spct;

```

```

/*process first layer*/
data ls2;set ls1;
if layernum=1;
proc sort;by co mtrs;
proc means mean noprint;by co mtrs;
var inch10 inch3 no4 no10 no40 no200 clay awc bd om salin cec perm laydep shrink;
output out=lay1 mean=inch101 inch31 no41 no101 no401 no2001 clay1 awc1 bd1
om1 salin1 cec1 perm1 laydep1 shrink1;
proc print;

/*surface layer data output to data set*/
data _null_;set lay1;
filename so 'd:\epa\soiltest\cluster99\apr99\rlay199.dat';
file so noprint lrecl=106;
put co 1-2 mtrs 4-12 laydep1 14-18 .2 shrink1 20-23 .2 inch101 25-30 .2
inch31 32-37 .2 no41 39-44 .2
no101 46-51 .2 no401 53-58 .2 no2001 60-65 .2 om1 67-70 .2
clay1 72-77 .2 bd1 79-82 .2 perm1 84-88 .2 awc1 90-93 .2
cec1 95-100 .2 salin1 102-106 .2;

run;

/*Data for soil layers below number 1 processed*/
data sub;set ls1;if layernum ne 1;
data sub1;set sub;if layernum ne .;

/*First produce mean values for each muid*/
proc sort;by co mtrs muid;
proc means mean noprint;by co mtrs muid;
var inch10 inch3 no4 no10 no40 no200 clay awc bd om salin cec perm laydep shrink;
output out=subm mean=inch10m inch3m no4m no10m no40m no200m claym awcm bdm
omm salinm cecm perm laydep shrinkm;

/*Produce mean values for each mtrs*/
proc sort;by co mtrs;
proc means mean noprint;by co mtrs;
var inch10m inch3m no4m no10m no40m no200m claym awcm bdm
omm salinm cecm perm laydep shrinkm;
output out=subavg2 mean=inch102 inch32 no42 no102
no402 no2002 clay2 awc2 bd2 om2 salin2 cec2 perm2 laydep2 shrink2;
proc print;
data _null_;set subavg2;
filename so 'd:\epa\soiltest\cluster99\apr99\rsub99.dat';
file so noprint lrecl=106;
put co 1-2 mtrs 4-12 laydep2 14-18 .2 shrink2 20-23 .2 inch102 25-30 .2
inch32 32-37 .2 no42 39-44 .2
no102 46-51 .2 no402 53-58 .2 no2002 60-65 .2 om2 67-70 .2
clay2 72-77 .2 bd2 79-82 .2 perm2 84-88 .2 awc2 90-93 .2
cec2 95-100 .2 salin2 102-106 .2;

run;

```

4. SAS program for correlation analyses.

```
/*corapr99.sas 4-22-99*/
/*Finalized COMP and LAYER tables were obtained from NRCS*/
/*in October 1997. Some of the data had been changed which*/
/*resulted in slight changes for averaged section soil data*/
/*Owing to the differences it was concluded that the vulnerabilty*/
/*analyses would have to be done again starting with the clustering*/
/*of soil data. Positive sections were determined as of 1-13-1999 and*/
/*for this analysis only DPR data for sections designated as PORN='N'*/
/*(Nonpoint source) and STATUS='P' was used. One section from a Ciba*/
/*was used. This program takes data which was spooled from Oracle tables*/
/*and averages variables where low and high values were determined*/
/*or assigns a numeric value to variables with descriptors such as*/
/*low, medium, and high. These data will be censored using*/
/*the slopeh <= 15% cutoff as determined from previous analyses*/

options ls=140 ps=50;
title1 'Correlation analysis of data from the Well Inventory as of:';
title2 'April 22, 1999';

/*composition data output to data set*/
data comp;infile 'd:\epa\soiltest\cluster99\apr99\rcomp99.dat';
input co 1-2 mtrs $ 4-12 drain 14-17 .2 wattab 19-22 .2
flood 24-27 .2 pan 29-33 .2 hyd 35-38 .2 slope 40-44 .2
watsoil 46-49 .2 bedrock 51-54 .2;
proc sort;by co mtrs;

/*surface layer data output to data set*/
data lay1;infile 'd:\epa\apr99\rlay199.dat' lrecl=106;
input co 1-2 mtrs $ 4-12 laydep1 14-18 .2 shrink1 20-23 .2 inch101 25-30 .2
inch31 32-37 .2 no41 39-44 .2
no101 46-51 .2 no401 53-58 .2 no2001 60-65 .2 om1 67-70 .2
clay1 72-77 .2 bd1 79-82 .2 perm1 84-88 .2 awc1 90-93 .2
cec1 95-100 .2 salin1 102-106 .2;
proc sort;by co mtrs;

data sub;infile 'd:\epa\apr99\rsub99.dat' lrecl=106;
file so noprint lrecl=106;
input co 1-2 mtrs $ 4-12 laydep2 14-18 .2 shrink2 20-23 .2 inch102
25-30 .2 inch32 32-37 .2 no42 39-44 .2
no102 46-51 .2 no402 53-58 .2 no2002 60-65 .2 om2 67-70 .2
clay2 72-77 .2 bd2 79-82 .2 perm2 84-88 .2 awc2 90-93 .2
cec2 95-100 .2 salin2 102-106 .2;
proc sort;by co mtrs;

data all;merge comp lay1 sub; by co mtrs;
data numbers;set all;if no2001 ne .;
proc corr;var no2001 no401 shrink1 clay1 perm1 awc1 no2002 no402
shrink2 clay2 perm2 awc2 no101 no41 inch31 inch101 no102 no42 inch32
inch102 drain wattab flood watsoil pan hyd bedrock slope bd1 cec1
salin1 om1 om2 bd2 cec2 salin2;
run;
```

5. SAS program for cluster analyses.

Step 1.

```
/*stp1apr.sas 4-22-99*/
/*Finalized COMP and LAYER tables were obtained from NRCS*/
/*in October 1997. Some of the data had been changed which*/
/*resulted in slight changes for averaged section soil data*/
/*Owing to the differences it was concluded that the vulnerability*/
/*analyses would have to be done again starting with the clustering*/
/*of soil data. Positive sections were determined as of 1-13-1999 and*/
/*for this analysis only DPR data for sections designated as PORN='N'*/
/*(Nonpoint source) and STATUS='P' was used. One section from a Ciba*/
/*was used. This program takes data which was spooled from Oracle tables*/
/*and averages variables where low and high values were determined*/
/*or assigns a numeric value to variables with descriptors such as*/
/*low, medium, and high. These data will be censored using*/
/*the slope <= 15% cutoff as determined from previous analyses*/

options ls=80 ps=60;
title1 'Cluster analysis of data from the Well Inventory as of: ';
title2 'April 22, 1999';

/*composition data output to data set*/
data comp;infile 'd:\epa\soiltest\cluster99\apr99\rcomp99.dat';
input co 1-2 mtrs $ 4-12 drain 14-17 .2 wattab 19-22 .2
flood 24-27 .2 pan 29-33 .2 hyd 35-38 .2 slope 40-44 .2
watsoil 46-49 .2 bedrock 51-54 .2;
proc sort;by co mtrs;

/*surface layer data output to data set*/
data lay1;infile 'd:\epa\soiltest\cluster99\apr99\rlay199.dat' lrecl=106;
input co 1-2 mtrs $ 4-12 laydep1 14-18 .2 shrink1 20-23 .2 inch101 25-30 .2
inch31 32-37 .2 no41 39-44 .2
no101 46-51 .2 no401 53-58 .2 no2001 60-65 .2 om1 67-70 .2
clay1 72-77 .2 bd1 79-82 .2 perm1 84-88 .2 awc1 90-93 .2
cec1 95-100 .2 salin1 102-106 .2;
proc sort;by co mtrs;

data sub;infile 'd:\epa\soiltest\cluster99\apr99\rsub99.dat' lrecl=106;
file so noprint lrecl=106;
input co 1-2 mtrs $ 4-12 laydep2 14-18 .2 shrink2 20-23 .2 inch102 25-30 .2
inch32 32-37 .2 no42 39-44 .2
no102 46-51 .2 no402 53-58 .2 no2002 60-65 .2 om2 67-70 .2
clay2 72-77 .2 bd2 79-82 .2 perm2 84-88 .2 awc2 90-93 .2
cec2 95-100 .2 salin2 102-106 .2;
proc sort;by co mtrs;

data all;merge comp lay1 sub; by co mtrs;

data numbers;set all;if no2001 ne .;

title5 'CLUSTERING ON no2001-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
var no2001;
run;
```

```
title5 'CLUSTERING ON no2001-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var no2001;
run;
```

```
title5 'CLUSTERING ON no401-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
  var no401;
run;
```

```
title5 'CLUSTERING ON no401-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var no401;
run;
```

```
title5 'CLUSTERING ON no101-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
  var no101;
run;
```

```
title5 'CLUSTERING ON no101-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var no101;
run;
```

```
title5 'CLUSTERING ON no41-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
  var no41;
run;
```

```
title5 'CLUSTERING ON no41-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var no41;
run;
```

```
title5 'CLUSTERING ON inch31-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
  var inch31;
```



```

run;

title5 'CLUSTERING ON inch31-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var inch31;
run;

title5 'CLUSTERING ON inch101-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
  var inch101;
run;

title5 'CLUSTERING ON inch101-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var inch101;
run;

title5 'CLUSTERING ON clay1-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
  var clay1;
run;

title5 'CLUSTERING ON clay1-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var clay1;
run;

title5 'CLUSTERING ON perm1-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
  var perm1;
run;

title5 'CLUSTERING ON perm1-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var perm1;
run;

title5 'CLUSTERING ON awc1-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;

```

```

var awc1;
run;

title5 'CLUSTERING ON awc1-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
var awc1;
run;

title5 'CLUSTERING ON shrink1-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
var shrink1;
run;

title5 'CLUSTERING ON shrink1-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
var shrink1;
run;
title5 'CLUSTERING ON no2002 - AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
var no2002;
run;

title5 'CLUSTERING ON no2002 - CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
var no2002;
run;

title5 'CLUSTERING ON no402-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
var no42;
run;

title5 'CLUSTERING ON no402-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
var no42;
run;

title5 'CLUSTERING ON no102 - AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
var no102;

```

```

run;

title5 'CLUSTERING ON no102 - CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var no102;
run;

title5 'CLUSTERING ON no42-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
  var no402;
run;

title5 'CLUSTERING ON no42-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var no402;
run;

title5 'CLUSTERING ON inch32-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
  var inch32;
run;

title5 'CLUSTERING ON inch32-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var inch32;
run;

title5 'CLUSTERING ON inch102 - AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
  var inch102;
run;

title5 'CLUSTERING ON inch102- CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var inch102;
run;

title5 'CLUSTERING ON clay2-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;

```

```

var clay2;
run;

title5 'CLUSTERING ON clay2-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
var clay2;
run;

title5 'CLUSTERING ON perm2-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
var perm2;
run;

title5 'CLUSTERING ON perm2-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
var perm2;
run;

title5 'CLUSTERING ON awc2-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
var awc2;
run;

title5 'CLUSTERING ON awc2-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
var awc2;
run;

title5 'CLUSTERING ON shrink2 - AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
var shrink2;
run;

title5 'CLUSTERING ON shrink2 - CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
var shrink2;
run;

title5 'CLUSTERING ON drain- AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;

```

```

var drain;
run;

title5 'CLUSTERING ON drain - CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
var drain;
run;

title5 'CLUSTERING ON wattab - AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
var wattab;
run;

title5 'CLUSTERING ON wattab - CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
var wattab;
run;

title5 'CLUSTERING ON flood-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
var flood;
run;

title5 'CLUSTERING ON flood-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
var flood;
run;

title5 'CLUSTERING ON watsoil-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
var watsoil;
run;

title5 'CLUSTERING ON watsoil-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
var watsoil;
run;

title5 'CLUSTERING ON pan-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;

```

```

var pan;
run;

title5 'CLUSTERING ON pan-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
var pan;
run;

title5 'CLUSTERING ON hyd - AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
var hyd;
run;

title5 'CLUSTERING ON hyd - CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
var hyd;
run;

title5 'CLUSTERING ON bd1-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
var bd1;
run;

title5 'CLUSTERING ON bd1-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
var bd1;
run;

title5 'CLUSTERING ON cec1-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
var cec1;
run;

title5 'CLUSTERING ON cec1-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
var cec1;
run;

title5 'CLUSTERING ON bedrock-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;

```

```

var bedrock;
run;

title5 'CLUSTERING ON bedrock-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
var bedrock;
run;

title5 'CLUSTERING ON salin1-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
var salin1;
run;

title5 'CLUSTERING ON salin1-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
var salin1;
run;

title5 'CLUSTERING ON slope-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
var slope;
run;

title5 'CLUSTERING ON slope-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
var slope;
run;

title5 'CLUSTERING ON om1 - AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
var om1;
run;

title5 'CLUSTERING ON om1 - CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
var om1;
run;

title5 'CLUSTERING ON om2 - AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard

```

```
method=average pseudo ccc;  
  var om2;  
run;
```

```
title5 'CLUSTERING ON om2 - CENTROID METHOD';  
title6 'All Vulnerable sections';  
proc cluster data=numbers out=tree p=20 standard  
method=centroid pseudo ccc;  
  var om2;  
run;
```

```
title5 'CLUSTERING ON bd2-AVERAGE METHOD';  
title6 'All Vulnerable sections';  
proc cluster data=numbers out=tree p=20 standard  
method=average pseudo ccc;  
  var bd2;  
run;
```

```
title5 'CLUSTERING ON bd2-CENTROID METHOD';  
title6 'All Vulnerable sections';  
proc cluster data=numbers out=tree p=20 standard  
method=centroid pseudo ccc;  
  var bd2;  
run;
```

```
title5 'CLUSTERING ON cec2-AVERAGE METHOD';  
title6 'All Vulnerable sections';  
proc cluster data=numbers out=tree p=20 standard  
method=average pseudo ccc;  
  var cec2;  
run;
```

```
title5 'CLUSTERING ON cec2-CENTROID METHOD';  
title6 'All Vulnerable sections';  
proc cluster data=numbers out=tree p=20 standard  
method=centroid pseudo ccc;  
  var cec2;  
run;
```

```
title5 'CLUSTERING ON caco32-AVERAGE METHOD';  
title6 'All Vulnerable sections';  
proc cluster data=numbers out=tree p=20 standard  
method=average pseudo ccc;  
  var caco32;  
run;
```

```
title5 'CLUSTERING ON caco32-CENTROID METHOD';  
title6 'All Vulnerable sections';  
proc cluster data=numbers out=tree p=20 standard  
method=centroid pseudo ccc;  
  var caco32;  
run;
```

```
title5 'CLUSTERING ON salin2 AVERAGE METHOD';  
title6 'All Vulnerable sections';
```



```

proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
  var salin2;
run;

```

```

title5 'CLUSTERING ON salin2-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var salin2;
run;

```

STEP 2.

```

/*stp2sh1.sas 4-22-99*/
/*Finalized COMP and LAYER tables were obtained from NRCS*/
/*in October 1997. Some of the data had been changed which*/
/*resulted in slight changes for averaged section soil data*/
/*Owing to the differences it was concluded that the vulnerability*/
/*analyses would have to be done again starting with the clustering*/
/*of soil data. Positive sections were determined as of 1-13-1999 and*/
/*for this analysis only DPR data for sections designated as PORN='N'*/
/*(Nonpoint source) and STATUS='P' was used. One section from a Ciba*/
/*was used. This program takes data which was spooled from Oracle tables*/
/*and averages variables where low and high values were determined*/
/*or assigns a numeric value to variables with descriptors such as*/
/*low, medium, and high. These data will be censored using*/
/*the slope <= 15% cutoff as determined from previous analyses*/

```

```

options ls=80 ps=60;
title1 'Cluster analysis of data from the Well Inventory as of: ';
title2 'April 22, 1999';

```

```

/*composition data output to data set*/
data comp;infile 'd:\epa\soiltest\cluster99\apr99\rcomp99.dat';
input co 1-2 mtrs $ 4-12 drain 14-17 .2 wattab 19-22 .2
flood 24-27 .2 pan 29-33 .2 hyd 35-38 .2 slope 40-44 .2
watsoil 46-49 .2 bedrock 51-54 .2;
proc sort;by co mtrs;

```

```

/*surface layer data output to data set*/
data lay1;infile 'd:\epa\soiltest\cluster99\apr99\rlay199.dat' lrecl=106;
input co 1-2 mtrs $ 4-12 laydep1 14-18 .2 shrink1 20-23 .2 inch101 25-30 .2
inch31 32-37 .2 no41 39-44 .2
no101 46-51 .2 no401 53-58 .2 no2001 60-65 .2 om1 67-70 .2
clay1 72-77 .2 bd1 79-82 .2 perm1 84-88 .2 awc1 90-93 .2
cec1 95-100 .2 salin1 102-106 .2;
proc sort;by co mtrs;

```

```

data sub;infile 'd:\epa\soiltest\cluster99\apr99\rsub99.dat' lrecl=106;
file so noprint lrecl=106;
input co 1-2 mtrs $ 4-12 laydep2 14-18 .2 shrink2 20-23 .2 inch102 25-30 .2
inch32 32-37 .2 no42 39-44 .2
no102 46-51 .2 no402 53-58 .2 no2002 60-65 .2 om2 67-70 .2
clay2 72-77 .2 bd2 79-82 .2 perm2 84-88 .2 awc2 90-93 .2
cec2 95-100 .2 salin2 102-106 .2;
proc sort;by co mtrs;

```

```
data all;merge comp lay1 sub; by co mtrs;
```

```
data numbers;set all;if no2001 ne .;
```

```
title5 'CLUSTERING ON shrink1 no101-AVERAGE METHOD';  
title6 'All Vulnerable sections';  
proc cluster data=numbers out=tree p=20 standard  
method=average pseudo ccc;  
var shrink1 no101;  
run;
```

```
title5 'CLUSTERING ON shrink1 no101-CENTROID METHOD';  
title6 'All Vulnerable sections';  
proc cluster data=numbers out=tree p=20 standard  
method=centroid pseudo ccc;  
var shrink1 no101;  
run;
```

```
title5 'CLUSTERING ON shrink1 no41-AVERAGE METHOD';  
title6 'All Vulnerable sections';  
proc cluster data=numbers out=tree p=20 standard  
method=average pseudo ccc;  
var shrink1 no41;  
run;
```

```
title5 'CLUSTERING ON shrink1 no41-CENTROID METHOD';  
title6 'All Vulnerable sections';  
proc cluster data=numbers out=tree p=20 standard  
method=centroid pseudo ccc;  
var shrink1 no41;  
run;
```

```
title5 'CLUSTERING ON shrink1 inch31-AVERAGE METHOD';  
title6 'All Vulnerable sections';  
proc cluster data=numbers out=tree p=20 standard  
method=average pseudo ccc;  
var shrink1 inch31;  
run;
```

```
title5 'CLUSTERING ON shrink1 inch31-CENTROID METHOD';  
title6 'All Vulnerable sections';  
proc cluster data=numbers out=tree p=20 standard  
method=centroid pseudo ccc;  
var shrink1 inch31;  
run;
```

```
title5 'CLUSTERING ON shrink1 inch101-AVERAGE METHOD';  
title6 'All Vulnerable sections';  
proc cluster data=numbers out=tree p=20 standard  
method=average pseudo ccc;  
var shrink1 inch101;  
run;
```

```
title5 'CLUSTERING ON shrink1 inch101-CENTROID METHOD';  
title6 'All Vulnerable sections';
```

```

proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var shrink1 inch101;
run;

title5 'CLUSTERING ON shrink1 perm1-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
  var shrink1 perm1;
run;

title5 'CLUSTERING ON shrink1 perm1-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var shrink1 perm1;
run;

title5 'CLUSTERING ON shrink1 awc1-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
  var shrink1 awc1;
run;

title5 'CLUSTERING ON shrink1 awc1-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var shrink1 awc1;
run;

title5 'CLUSTERING ON shrink1 no102 - AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
  var shrink1 no102;
run;

title5 'CLUSTERING ON shrink1 no102 - CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var shrink1 no102;
run;

title5 'CLUSTERING ON shrink1 no42-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
  var shrink1 no402;
run;

title5 'CLUSTERING ON shrink1 no42-CENTROID METHOD';
title6 'All Vulnerable sections';

```

```
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var shrink1 no402;
run;
```

```
title5 'CLUSTERING ON shrink1 inch32-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
  var shrink1 inch32;
run;
```

```
title5 'CLUSTERING ON shrink1 inch32-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var shrink1 inch32;
run;
```

```
title5 'CLUSTERING ON shrink1 inch102 - AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
  var shrink1 inch102;
run;
```

```
title5 'CLUSTERING ON shrink1 inch102- CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var shrink1 inch102;
run;
```

```
title5 'CLUSTERING ON shrink1 perm2-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
  var shrink1 perm2;
run;
```

```
title5 'CLUSTERING ON shrink1 perm2-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var shrink1 perm2;
run;
```

```
title5 'CLUSTERING ON shrink1 awc2-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
  var shrink1 awc2;
run;
```

```
title5 'CLUSTERING ON shrink1 awc2-CENTROID METHOD';
```

```
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var shrink1 awc2;
run;
```

```
title5 'CLUSTERING ON shrink1 drain- AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
  var shrink1 drain;
run;
```

```
title5 'CLUSTERING ON shrink1 drain - CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var shrink1 drain;
run;
```

```
title5 'CLUSTERING ON shrink1 wattab - AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
  var shrink1 wattab;
run;
```

```
title5 'CLUSTERING ON shrink1 wattab - CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var shrink1 wattab;
run;
```

```
title5 'CLUSTERING ON shrink1 flood-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
  var shrink1 flood;
run;
```

```
title5 'CLUSTERING ON shrink1 flood-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var shrink1 flood;
run;
```

```
title5 'CLUSTERING ON shrink1 watsoil-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
  var shrink1 watsoil;
run;
```

```
title5 'CLUSTERING ON shrink1 watsoil-CENTROID METHOD';
```

```
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var shrink1 watsoil;
run;
```

```
title5 'CLUSTERING ON shrink1 pan-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
  var shrink1 pan;
run;
```

```
title5 'CLUSTERING ON shrink1 pan-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var shrink1 pan;
run;
```

```
title5 'CLUSTERING ON shrink1 hyd - AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
  var shrink1 hyd;
run;
```

```
title5 'CLUSTERING ON shrink1 hyd - CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var shrink1 hyd;
run;
```

```
title5 'CLUSTERING ON shrink1 bedrock-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
  var shrink1 bedrock;
run;
```

```
title5 'CLUSTERING ON shrink1 bedrock-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var shrink1 bedrock;
run;
```

```
title5 'CLUSTERING ON shrink1 salin1-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
  var shrink1 salin1;
run;
```

```
title5 'CLUSTERING ON shrink1 salin1-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var shrink1 salin1;
run;
```

```
title5 'CLUSTERING ON shrink1 slope-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
  var shrink1 slope;
run;
```

```
title5 'CLUSTERING ON shrink1 slope-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var shrink1 slope;
run;
```

```
title5 'CLUSTERING ON shrink1 om1 - AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
  var shrink1 om1;
run;
```

```
title5 'CLUSTERING ON shrink1 om1 - CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var shrink1 om1;
run;
```

```
title5 'CLUSTERING ON shrink1 om2 - AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
  var shrink1 om2;
run;
```

```
title5 'CLUSTERING ON shrink1 om2 - CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
  var shrink1 om2;
run;
```

```
title5 'CLUSTERING ON shrink1 bd2-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
  var shrink1 bd2;
```

```

run;

title5 'CLUSTERING ON shrink1 bd2-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
var shrink1 bd2;
run;

```

```

title5 'CLUSTERING ON shrink1 cec2-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
var shrink1 cec2;
run;

```

```

title5 'CLUSTERING ON shrink1 cec2-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
var shrink1 cec2;
run;

```

```

title5 'CLUSTERING ON shrink1 salin2 AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=average pseudo ccc;
var shrink1 salin2;
run;

```

```

title5 'CLUSTERING ON shrink1 salin2-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=20 standard
method=centroid pseudo ccc;
var shrink1 salin2;
run;

```

Step 3

```

/*stp3wsh1.sas 4-22-99*/
/*Finalized COMP and LAYER tables were obtained from NRCS*/
/*in October 1997. Some of the data had been changed which*/
/*resulted in slight changes for averaged section soil data*/
/*Owing to the differences it was concluded that the vulnerabilty*/
/*analyses would have to be done again starting with the clustering*/
/*of soil data. Positive sections were determined as of 1-13-1999 and*/
/*for this analysis only DPR data for sections designated as PORN='N'*/
/*(Nonpoint source) and STATUS='P' was used. One section from a Ciba*/
/*was used. This program takes data which was spooled from Oracle tables*/
/*and averages variables where low and high values were determined*/
/*or assigns a numeric value to variables with descriptors such as*/
/*low, medium, and high. These data will be censored using*/
/*the slopeh <= 15% cutoff as determined from previous analyses*/

```

```

options ls=80 ps=60;
title1 'Cluster analysis of data from the Well Inventory as of: ';
title2 'April 22, 1999';

```



```

/*composition data output to data set*/
data comp;infile 'd:\epa\soiltest\cluster99\apr99\rcomp99.dat';
input co 1-2 mtrs $ 4-12 drain 14-17 .2 wattab 19-22 .2
flood 24-27 .2 pan 29-33 .2 hyd 35-38 .2 slope 40-44 .2
watsoil 46-49 .2 bedrock 51-54 .2;
proc sort;by co mtrs;

/*surface layer data output to data set*/
data lay1;infile 'd:\epa\soiltest\cluster99\apr99\rlay199.dat' lrecl=106;
input co 1-2 mtrs $ 4-12 laydep1 14-18 .2 shrink1 20-23 .2 inch101 25-30 .2
inch31 32-37 .2 no41 39-44 .2
no101 46-51 .2 no401 53-58 .2 no2001 60-65 .2 om1 67-70 .2
clay1 72-77 .2 bd1 79-82 .2 perm1 84-88 .2 awc1 90-93 .2
cec1 95-100 .2 salin1 102-106 .2;
proc sort;by co mtrs;

data sub;infile 'd:\epa\soiltest\cluster99\apr99\rsub99.dat' lrecl=106;
file so noprint lrecl=106;
input co 1-2 mtrs $ 4-12 laydep2 14-18 .2 shrink2 20-23 .2 inch102 25-30 .2
inch32 32-37 .2 no42 39-44 .2
no102 46-51 .2 no402 53-58 .2 no2002 60-65 .2 om2 67-70 .2
clay2 72-77 .2 bd2 79-82 .2 perm2 84-88 .2 awc2 90-93 .2
cec2 95-100 .2 salin2 102-106 .2;
proc sort;by co mtrs;

data all;merge comp lay1 sub; by co mtrs;

data numbers;set all;if no2001 ne .;

title5 'CLUSTERING ON shrink1 wattab perm1 no101-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
var shrink1 wattab perm1 no101;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 no101-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
var shrink1 wattab perm1 no101;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 no41-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
var shrink1 wattab perm1 no41;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 no41-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
var shrink1 wattab perm1 no41;

```

```

run;

title5 'CLUSTERING ON shrink1 wattab perm1 inch31-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
var shrink1 wattab perm1 inch31;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 inch31-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
var shrink1 wattab perm1 inch31;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 inch101-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
var shrink1 wattab perm1 inch101;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 inch101-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
var shrink1 wattab perm1 inch101;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 perm1-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
var shrink1 wattab perm1 perm1;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 perm1-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
var shrink1 wattab perm1 perm1;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 no102 - AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
var shrink1 wattab perm1 no102;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 no102 - CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
var shrink1 wattab perm1 no102;

```

```
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 no42-AVERAGE METHOD';  
title6 'All Vulnerable sections';  
proc cluster data=numbers out=tree p=25 standard  
method=average pseudo ccc;  
var shrink1 wattab perm1 no402;  
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 no42-CENTROID METHOD';  
title6 'All Vulnerable sections';  
proc cluster data=numbers out=tree p=25 standard  
method=centroid pseudo ccc;  
var shrink1 wattab perm1 no402;  
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 inch32-AVERAGE METHOD';  
title6 'All Vulnerable sections';  
proc cluster data=numbers out=tree p=25 standard  
method=average pseudo ccc;  
var shrink1 wattab perm1 inch32;  
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 inch32-CENTROID METHOD';  
title6 'All Vulnerable sections';  
proc cluster data=numbers out=tree p=25 standard  
method=centroid pseudo ccc;  
var shrink1 wattab perm1 inch32;  
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 inch102 - AVERAGE METHOD';  
title6 'All Vulnerable sections';  
proc cluster data=numbers out=tree p=25 standard  
method=average pseudo ccc;  
var shrink1 wattab perm1 inch102;  
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 inch102- CENTROID METHOD';  
title6 'All Vulnerable sections';  
proc cluster data=numbers out=tree p=25 standard  
method=centroid pseudo ccc;  
var shrink1 wattab perm1 inch102;  
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 awc2-AVERAGE METHOD';  
title6 'All Vulnerable sections';  
proc cluster data=numbers out=tree p=25 standard  
method=average pseudo ccc;  
var shrink1 wattab perm1 awc2;  
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 awc2-CENTROID METHOD';  
title6 'All Vulnerable sections';  
proc cluster data=numbers out=tree p=25 standard  
method=centroid pseudo ccc;  
var shrink1 wattab perm1 awc2;
```

```

run;

title5 'CLUSTERING ON shrink1 wattab perm1 drain - AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
  var shrink1 wattab perm1 drain;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 drain - CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
  var shrink1 wattab perm1 drain;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 flood-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
  var shrink1 wattab perm1 flood;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 flood-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
  var shrink1 wattab perm1 flood;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 watsoil-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
  var shrink1 wattab perm1 watsoil;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 watsoil-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
  var shrink1 wattab perm1 watsoil;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 pan-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
  var shrink1 wattab perm1 pan;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 pan-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;

```

```
var shrink1 wattab perm1 pan;  
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 bedrock-AVERAGE METHOD';  
title6 'All Vulnerable sections';  
proc cluster data=numbers out=tree p=25 standard  
method=average pseudo ccc;  
var shrink1 wattab perm1 bedrock;  
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 bedrock-CENTROID METHOD';  
title6 'All Vulnerable sections';  
proc cluster data=numbers out=tree p=25 standard  
method=centroid pseudo ccc;  
var shrink1 wattab perm1 bedrock;  
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 salin1-AVERAGE METHOD';  
title6 'All Vulnerable sections';  
proc cluster data=numbers out=tree p=25 standard  
method=average pseudo ccc;  
var shrink1 wattab perm1 salin1;  
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 salin1-CENTROID METHOD';  
title6 'All Vulnerable sections';  
proc cluster data=numbers out=tree p=25 standard  
method=centroid pseudo ccc;  
var shrink1 wattab perm1 salin1;  
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 slope-AVERAGE METHOD';  
title6 'All Vulnerable sections';  
proc cluster data=numbers out=tree p=25 standard  
method=average pseudo ccc;  
var shrink1 wattab perm1 slope;  
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 slope-CENTROID METHOD';  
title6 'All Vulnerable sections';  
proc cluster data=numbers out=tree p=25 standard  
method=centroid pseudo ccc;  
var shrink1 wattab perm1 slope;  
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 om1 - AVERAGE METHOD';  
title6 'All Vulnerable sections';  
proc cluster data=numbers out=tree p=25 standard  
method=average pseudo ccc;  
var shrink1 wattab perm1 om1;  
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 om1 - CENTROID METHOD';  
title6 'All Vulnerable sections';  
proc cluster data=numbers out=tree p=25 standard
```

```

method=centroid pseudo ccc;
  var shrink1 wattab perm1 om1;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 om2 - AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
  var shrink1 wattab perm1 om2;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 om2 - CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
  var shrink1 wattab perm1 om2;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 bd2-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
  var shrink1 wattab perm1 bd2;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 bd2-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
  var shrink1 wattab perm1 bd2;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 cec2-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
  var shrink1 wattab perm1 cec2;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 cec2-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
  var shrink1 wattab perm1 cec2;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 salin2 AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
  var shrink1 wattab perm1 salin2;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 salin2-CENTROID METHOD';
title6 'All Vulnerable sections';

```

```

proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
  var shrink1 watab perm1 salin2;
run;

```

STEP 4.

```

/*stp3wsh1.sas 4-22-99*/
/*Finalized COMP and LAYER tables were obtained from NRCS*/
/*in October 1997. Some of the data had been changed which*/
/*resulted in slight changes for averaged section soil data*/
/*Owing to the differences it was concluded that the vulnerability*/
/*analyses would have to be done again starting with the clustering*/
/*of soil data. Positive sections were determined as of 1-13-1999 and*/
/*for this analysis only DPR data for sections designated as PORN='N'*/
/*(Nonpoint source) and STATUS='P' was used. One section from a Ciba*/
/*was used. This program takes data which was spooled from Oracle tables*/
/*and averages variables where low and high values were determined*/
/*or assigns a numeric value to variables with descriptors such as*/
/*low, medium, and high. These data will be censored using*/
/*the slopeh <= 15% cutoff as determined from previous analyses*/

```

```

options ls=80 ps=60;
title1 'Cluster analysis of data from the Well Inventory as of: ';
title2 'April 22, 1999';

```

```

/*composition data output to data set*/
data comp;infile 'd:\epa\soiltest\cluster99\apr99\rcomp99.dat';
input co 1-2 mtrs $ 4-12 drain 14-17 .2 watab 19-22 .2
flood 24-27 .2 pan 29-33 .2 hyd 35-38 .2 slope 40-44 .2
watsoil 46-49 .2 bedrock 51-54 .2;
proc sort;by co mtrs;

```

```

/*surface layer data output to data set*/
data lay1;infile 'd:\epa\soiltest\cluster99\apr99\rlay199.dat' lrecl=106;
input co 1-2 mtrs $ 4-12 laydep1 14-18 .2 shrink1 20-23 .2 inch101 25-30 .2
inch31 32-37 .2 no41 39-44 .2
no101 46-51 .2 no401 53-58 .2 no2001 60-65 .2 om1 67-70 .2
clay1 72-77 .2 bd1 79-82 .2 perm1 84-88 .2 awc1 90-93 .2
cec1 95-100 .2 salin1 102-106 .2;
proc sort;by co mtrs;

```

```

data sub;infile 'd:\epa\soiltest\cluster99\apr99\rsub99.dat' lrecl=106;
file so noprint lrecl=106;
input co 1-2 mtrs $ 4-12 laydep2 14-18 .2 shrink2 20-23 .2 inch102 25-30 .2
inch32 32-37 .2 no42 39-44 .2
no102 46-51 .2 no402 53-58 .2 no2002 60-65 .2 om2 67-70 .2
clay2 72-77 .2 bd2 79-82 .2 perm2 84-88 .2 awc2 90-93 .2
cec2 95-100 .2 salin2 102-106 .2;
proc sort;by co mtrs;

```

```

data all;merge comp lay1 sub; by co mtrs;

```

```

data numbers;set all;if no2001 ne .;

```

```

title5 'CLUSTERING ON shrink1 watab perm1 pan no101-AVERAGE METHOD';
title6 'All Vulnerable sections';

```

```

proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
  var shrink1 wattab perm1 pan no101;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 pan no101-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
  var shrink1 wattab perm1 pan no101;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 pan no41-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
  var shrink1 wattab perm1 pan no41;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 pan no41-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
  var shrink1 wattab perm1 pan no41;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 pan inch31-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
  var shrink1 wattab perm1 pan inch31;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 pan inch31-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
  var shrink1 wattab perm1 pan inch31;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 pan inch101-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
  var shrink1 wattab perm1 pan inch101;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 pan inch101-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
  var shrink1 wattab perm1 pan inch101;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 pan perm1-AVERAGE METHOD';
title6 'All Vulnerable sections';

```



```

proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
  var shrink1 wattab perm1 pan perm1;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 pan perm1-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
  var shrink1 wattab perm1 pan perm1;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 pan no102 - AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
  var shrink1 wattab perm1 pan no102;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 pan no102 - CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
  var shrink1 wattab perm1 pan no102;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 pan no42-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
  var shrink1 wattab perm1 pan no402;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 pan no42-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
  var shrink1 wattab perm1 pan no402;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 pan inch32-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
  var shrink1 wattab perm1 pan inch32;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 pan inch32-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
  var shrink1 wattab perm1 pan inch32;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 pan inch102 - AVERAGE METHOD';
title6 'All Vulnerable sections';

```

```

proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
  var shrink1 wattab perm1 pan  inch102;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 pan  inch102- CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
  var shrink1 wattab perm1 pan  inch102;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 pan awc2-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
  var shrink1 wattab perm1 pan  awc2;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 pan  awc2-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
  var shrink1 wattab perm1 pan  awc2;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 pan drain- AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
  var shrink1 wattab perm1 pan  drain;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 pan  drain - CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
  var shrink1 wattab perm1 pan  drain;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 pan flood-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
  var shrink1 wattab perm1 pan  flood;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 pan  flood-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
  var shrink1 wattab perm1 pan  flood;
run;

title5 'CLUSTERING ON shrink1 wattab perm1 pan watsoil-AVERAGE METHOD';

```

```
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
var shrink1 wattab perm1 pan watsoil;
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 pan watsoil-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
var shrink1 wattab perm1 pan watsoil;
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 pan pan-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
var shrink1 wattab perm1 pan pan;
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 pan pan-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
var shrink1 wattab perm1 pan pan;
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 pan bedrock-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
var shrink1 wattab perm1 pan bedrock;
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 pan bedrock-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
var shrink1 wattab perm1 pan bedrock;
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 pan salin1-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
var shrink1 wattab perm1 pan salin1;
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 pan salin1-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
var shrink1 wattab perm1 pan salin1;
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 pan slope-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
  var shrink1 wattab perm1 pan slope;
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 pan slope-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
  var shrink1 wattab perm1 pan slope;
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 pan om1 - AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
  var shrink1 wattab perm1 pan om1;
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 pan om1 - CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
  var shrink1 wattab perm1 pan om1;
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 pan om2 - AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
  var shrink1 wattab perm1 pan om2;
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 pan om2 - CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
  var shrink1 wattab perm1 pan om2;
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 pan bd2-AVERAGE METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=average pseudo ccc;
  var shrink1 wattab perm1 pan bd2;
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 pan bd2-CENTROID METHOD';
title6 'All Vulnerable sections';
proc cluster data=numbers out=tree p=25 standard
method=centroid pseudo ccc;
  var shrink1 wattab perm1 pan bd2;
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 pan salin2 AVERAGE METHOD';  
title6 'All Vulnerable sections';  
proc cluster data=numbers out=tree p=25 standard  
method=average pseudo ccc;  
var shrink1 wattab perm1 pan salin2;  
run;
```

```
title5 'CLUSTERING ON shrink1 wattab perm1 pan salin2-CENTROID METHOD';  
title6 'All Vulnerable sections';  
proc cluster data=numbers out=tree p=25 standard  
method=centroid pseudo ccc;  
var shrink1 wattab perm1 pan salin2;  
run;
```


Data Used for Cluster Analysis Generated from Programs #3a and #3b and Merged in Programs #4 and #5.

04

Cluster analysis of data from the Well Inventory as of:

13:14 Tuesday, September 7, 1999

April 22, 1999

OBS	CO	MTRS	DRAIN	WATTAB	FLOOD	PAN	HYD	SLOPE	WATSOIL	BEDROCK	LAYDEP1	SHRINK1	INCH101	INCH31	N041	N0101	N0401	N02001	OMI	CLAY1
1	6	MI3N01W06	2.60	0.60	0.00	0.00	0.60	0.70	0.00	0.00	8.40	1.00	0.00	0.00	95.00	92.50	87.50	69.00	1.50	26.20
2	6	MI4N01W32	1.83	0.83	0.50	0.00	1.00	0.50	0.00	0.00	11.08	1.50	0.00	0.00	100.00	99.58	96.67	88.75	1.92	36.17
3	6	MI7N02W02	1.75	1.00	0.75	0.00	1.00	0.88	0.00	0.00	6.13	1.25	0.00	0.00	100.00	98.75	95.63	81.25	1.88	28.63
4	6	MI8N01W18	2.67	0.78	0.22	0.00	0.67	1.11	0.22	0.00	5.83	0.89	0.00	0.00	100.00	98.89	94.17	80.00	2.11	27.72
5	6	MI8N01W19	2.93	0.75	0.50	0.00	0.56	1.22	0.38	0.00	5.88	0.63	0.00	0.00	99.38	98.13	88.13	68.75	1.69	21.50
6	6	MI8N02W19	1.00	1.00	0.50	0.00	1.00	0.50	0.00	0.00	4.75	1.00	0.00	0.00	100.00	100.00	98.75	91.25	2.50	33.50
7	6	MI8N02W24	1.50	1.00	0.25	0.00	1.00	0.63	0.00	0.00	6.00	1.50	0.00	0.00	100.00	99.38	96.25	86.25	2.00	34.00
8	6	MI8N02W25	2.00	0.75	0.25	0.00	0.75	0.75	0.00	0.00	6.88	1.25	0.00	0.00	97.50	96.88	90.63	81.88	2.13	33.50
9	6	MI8N02W35	1.43	1.00	0.71	0.00	1.00	0.71	0.00	0.00	5.29	1.00	0.00	0.00	100.00	99.29	97.14	85.36	2.21	29.07
10	7	MD2N02W14	2.33	0.33	0.00	0.00	1.00	3.33	0.33	0.00	11.33	2.00	0.00	0.00	100.00	100.00	95.00	88.33	2.00	47.50
11	7	MD2N02W24	3.10	0.10	0.00	0.00	0.90	2.80	0.10	0.10	11.05	1.40	0.00	0.00	98.00	96.75	91.50	82.00	2.30	38.50
12	10	MI2S20E01	3.74	0.11	0.00	0.11	0.08	2.45	0.16	0.03	6.29	0.00	0.13	1.05	94.21	89.14	62.30	38.42	1.18	11.54
13	10	MI2S20E24	3.00	0.25	0.25	0.75	0.50	1.13	0.25	0.00	6.38	0.50	0.00	0.00	98.13	91.88	69.38	51.25	1.19	22.00
14	10	MI2S21E25	3.08	0.17	0.08	0.83	0.67	1.63	0.17	0.00	6.77	0.36	0.00	0.00	98.18	94.77	74.77	53.86	1.02	22.05
15	10	MI3S17E23	4.00	0.00	0.00	0.33	0.00	1.00	0.00	0.00	8.00	0.00	0.00	0.00	94.17	90.00	62.50	42.50	0.75	12.50
16	10	MI3S19E27	3.60	0.00	0.00	1.00	1.00	1.20	0.00	0.00	6.00	0.00	0.00	0.00	97.50	93.13	68.13	45.63	0.56	15.00
17	10	MI3S21E01	3.25	0.13	0.06	0.50	0.63	1.78	0.19	0.06	7.33	0.40	0.00	0.00	98.33	95.00	73.50	52.67	1.05	21.67
18	10	MI3S22E04	3.27	0.09	0.00	0.36	0.91	3.45	0.09	0.27	5.40	0.40	0.00	0.00	96.50	94.25	82.50	61.50	1.03	25.85
19	10	MI3S22E06	3.54	0.08	0.08	0.46	0.31	2.62	0.08	0.00	7.83	0.17	0.00	0.00	97.71	93.75	69.17	47.71	0.90	16.08
20	10	MI3S22E26	3.78	0.11	0.06	0.33	0.28	1.78	0.11	0.00	7.97	0.11	0.00	0.14	98.47	94.72	68.47	41.67	0.94	12.92
21	10	MI3S22E33	3.83	0.00	0.00	0.25	0.17	1.75	0.08	0.00	7.75	0.00	0.00	0.00	98.96	96.46	65.63	35.21	0.98	9.83
22	10	MI3S22E36	3.40	0.10	0.10	0.70	0.60	1.75	0.10	0.20	8.75	0.60	0.00	3.25	98.25	95.50	76.50	55.25	1.08	24.35
23	10	MI3S23E24	3.79	0.25	0.17	0.17	0.50	3.83	0.33	0.17	6.38	0.33	0.00	1.04	93.33	89.58	68.54	45.83	1.42	19.67
24	10	MI3S23E26	3.40	0.38	0.13	0.19	0.40	1.31	0.50	0.06	6.47	0.13	0.00	0.33	96.00	93.50	71.33	45.17	1.82	14.57
25	10	MI3S23E27	3.82	0.00	0.00	0.29	0.57	2.64	0.00	0.14	6.50	0.50	0.00	6.07	95.54	91.43	74.46	56.25	1.13	23.57
26	10	MI3S23E28	3.77	0.00	0.00	0.36	0.91	4.82	0.00	0.27	8.64	1.18	0.00	8.64	92.95	87.73	77.27	65.00	1.32	35.77
27	10	MI3S23E31	3.57	0.07	0.00	0.40	0.93	4.27	0.07	0.20	8.33	1.00	0.00	6.17	93.83	90.00	77.00	61.67	1.29	32.83
28	10	MI3S23E32	3.59	0.00	0.00	0.45	0.91	3.86	0.00	0.18	8.32	0.82	0.00	4.77	95.45	91.36	76.82	59.55	1.14	29.64
29	10	MI3S23E33	3.50	0.08	0.08	0.33	0.50	1.88	0.17	0.00	7.00	0.33	0.21	4.17	94.17	89.58	68.33	47.50	1.40	19.67
30	10	MI3S23E34	3.56	0.29	0.24	0.18	0.31	1.35	0.41	0.00	5.74	0.00	0.16	1.56	94.06	89.69	63.44	36.72	1.46	10.97

OBS	BD1	PERM1	AWC1	CEC1	SALIN1	LAYDEP2	SHRINK2	INCH102	INCH32	N042	N0102	N0402	N02002	OM2	CLAY2	BD2	PERM2	AWC2	CEC2	SALIN2
1	1.51	0.89	0.14	26.00	1.00	41.37	1.30	0.00	0.00	95.00	92.50	88.17	72.42	1.02	34.40	1.48	0.78	0.14	28.67	1.00
2	1.37	0.52	0.17	30.00	1.33	41.97	1.64	0.00	0.00	100.00	99.58	97.08	89.86	0.95	43.54	1.42	0.31	0.16	30.28	1.33
3	1.46	0.98	0.18	31.25	1.75	34.38	1.75	0.00	0.00	100.00	98.75	95.63	86.25	1.19	39.13	1.39	0.35	0.17	36.25	3.88
4	1.46	0.96	0.17	23.61	0.78	35.61	1.11	0.00	0.00	100.00	98.89	91.39	78.75	0.71	33.08	1.46	1.30	0.15	24.86	2.28
5	1.46	1.48	0.16	21.43	0.63	35.84	0.69	0.00	0.00	98.44	97.19	84.38	67.03	0.76	24.72	1.47	1.97	0.14	21.43	1.56
6	1.39	0.67	0.16	27.50	1.50	31.50	1.25	0.00	0.00	100.00	100.00	97.50	90.00	1.29	39.25	1.39	0.44	0.16	27.50	3.50
7	1.44	0.67	0.17	33.13	1.75	35.25	1.63	0.00	0.00	100.00	99.38	96.25	88.75	1.31	42.44	1.41	0.29	0.17	36.88	4.38
8	1.43	0.67	0.16	29.38	1.25	37.81	1.25	0.00	0.00	97.50	96.88	90.00	80.00	1.16	36.69	1.43	0.55	0.16	30.00	3.38
9	1.42	0.94	0.17	29.64	1.57	32.43	1.50	0.00	0.00	100.00	99.29	96.43	87.50	1.24	37.29	1.38	0.45	0.17	32.86	3.36
10	1.42	0.13	0.15	38.00	2.33	43.50	2.00	0.00	0.00	100.00	100.00	95.00	83.33	0.54	45.42	1.42	0.13	0.15	34.08	4.67
11	1.41	0.27	0.17	30.25	1.86	42.20	1.65	0.00	0.00	96.13	95.00	89.88	77.25	0.41	40.15	1.40	0.22	0.14	27.43	1.89
12	1.56	4.81	0.12	7.75	0.32	37.88	0.77	0.13	0.66	92.12	87.88	64.58	41.36	0.32	13.47	1.54	4.22	0.11	8.27	0.46
13	1.51	1.01	0.12	16.88	0.00	30.27	0.83	0.00	0.00	97.92	91.46	72.60	55.10	0.33	27.94	1.52	1.00	0.09	18.13	0.25
14	1.51	1.41	0.13	16.14	0.00	31.90	0.86	0.00	0.00	97.85	94.13	75.14	51.91	0.27	28.06	1.55	0.82	0.08	18.02	0.25
15	1.53	4.00	0.13	7.50	0.00	38.33	0.00	0.00	0.00	95.42	92.08	67.92	49.17	0.25	14.58	1.55	3.36	0.11	8.33	0.00
16	1.54	1.30	0.12	9.38	0.00	24.17	0.33	0.00	0.00	97.08	93.42	78.17	45.42	0.21	24.40	1.52	0.83	0.07	14.17	0.00
17	1.51	1.85	0.13	16.83	0.27	33.67	0.65	0.00	0.00	97.99	95.05	73.98	50.08	0.32	25.42	1.53	1.28	0.09	16.28	0.38
18	1.47	1.16	0.15	19.00	0.10	29.50	1.12	0.00	0.00	96.33	94.24	79.58	58.45	0.30	33.57	1.55	0.41	0.08	20.72	0.18
19	1.51	2.78	0.13	12.29	0.00	35.70	0.40	0.00	0.00	96.99	93.78	67.88	46.54	0.28	19.94	1.56	2.40	0.10	12.01	0.08
20	1.55	4.93	0.12	9.83	0.00	36.43	0.28	0.00	0.14	97.66	94.49	68.50	40.44	0.29	16.59	1.55	3.77	0.10	10.07	0.17
21	1.58	6.33	0.11	7.25	0.00	35.65	0.17	0.00	0.00	98.16	96.22	66.91	38.37	0.27	13.64	1.58	4.68	0.10	7.48	0.08
22	1.48	1.49	0.14	19.75	0.20	32.46	1.02	0.00	2.75	98.33	95.17	76.04	55.67	0.38	30.70	1.51	1.14	0.08	22.19	0.40
23	1.52	3.96	0.12	15.50	0.67	35.60	0.79	0.00	0.63	95.00	91.67	73.02	49.90	0.40	24.67	1.52	3.59	0.09	17.38	0.83
24	1.54	4.22	0.11	10.84	2.75	34.64	0.23	0.00	0.33	95.97	93.44	73.06	46.31	0.48	15.68	1.54	3.48	0.10	10.51	3.18
25	1.49	1.31	0.13	18.21	1.36	32.06	0.79	0.00	3.30	93.27	89.82	76.07	55.27	0.37	27.48	1.51	1.07	0.11	19.13	1.51
26	1.42	0.58	0.14	29.09	0.55	33.31	1.32	0.00	4.32	91.48	88.37	78.45	61.86	0.49	37.61	1.44	0.46	0.09	29.53	0.59
27	1.45	0.75	0.14	25.67	0.40	34.79	1.34	0.00	3.31	93.78	90.97	78.86	60.17	0.45	37.21	1.47	0.37	0.09	28.07	0.57
28	1.47	0.79	0.14	23.18	0.36	32.72	1.15	0.00	1.70	93.22	90.72	77.61	57.39	0.41	34.32	1.50	0.45	0.09	24.95	0.41
29	1.52	2.98	0.13	15.25	0.25	34.69	0.58	0.21	2.29											

37	10	MI4S21E20	4.18	0.00	0.09	0.36	0.09	1.59	0.00	0.00	6.14	0.00	0.00	0.23	96.59	92.27	61.59	38.64	0.73	10.82
38	10	MI4S21E21	4.00	0.00	0.00	0.44	0.11	1.11	0.00	0.00	7.61	0.00	0.00	0.00	96.67	92.50	63.06	42.22	0.72	12.33
39	10	MI4S21E23	4.00	0.00	0.00	0.63	0.25	1.75	0.00	0.13	7.88	0.00	0.00	0.00	96.56	92.50	66.25	41.88	0.69	12.44
40	10	MI4S21E24	4.00	0.00	0.00	0.63	0.25	1.75	0.00	0.00	7.38	0.00	0.00	0.00	96.25	89.38	63.44	43.44	0.69	12.69
41	10	MI4S21E25	4.14	0.00	0.00	0.29	0.14	1.13	0.00	0.14	6.43	0.00	0.00	0.00	97.14	93.21	62.86	40.00	0.71	11.29
42	10	MI4S21E26	4.14	0.00	0.00	0.57	0.29	1.79	0.00	0.14	6.36	0.00	0.00	0.00	97.14	93.21	67.50	43.21	0.68	11.79
43	10	MI4S21E28	4.10	0.00	0.00	0.20	0.10	1.10	0.00	0.00	6.75	0.00	0.00	0.00	96.75	93.00	62.50	40.50	0.73	11.60
44	10	MI4S21E32	4.33	0.00	0.00	0.17	0.00	1.17	0.00	0.00	5.67	0.00	0.00	0.00	97.50	95.42	63.33	36.67	0.75	9.17
45	10	MI4S21E34	4.44	0.00	0.00	0.11	0.11	1.72	0.00	0.00	5.11	0.00	0.00	0.00	98.61	96.94	62.22	33.61	0.72	8.33
46	10	MI4S21E36	4.22	0.11	0.00	0.11	0.11	2.22	0.11	0.00	5.22	0.00	0.00	0.00	98.89	97.50	61.94	30.56	0.72	7.50
47	10	MI4S22E01	3.56	0.00	0.07	0.56	0.44	1.78	0.00	0.00	6.72	0.00	0.00	0.00	97.50	90.28	67.50	45.83	0.75	13.78
48	10	MI4S22E02	3.80	0.12	0.07	0.67	0.33	1.30	0.00	0.00	7.40	0.00	0.00	0.00	98.33	95.00	66.50	40.50	0.83	13.20
49	10	MI4S22E12	3.47	0.07	0.06	0.41	0.41	1.65	0.12	0.06	8.15	0.00	0.00	0.00	97.34	91.88	65.31	43.44	0.84	12.78
50	10	MI4S22E13	3.13	0.31	0.13	0.13	0.19	1.13	0.44	0.00	6.88	0.00	0.17	1.33	95.83	90.33	64.00	39.33	1.73	11.20
51	10	MI4S22E14	4.10	0.00	0.10	0.40	0.19	1.15	0.00	0.00	6.75	0.00	0.00	0.25	96.25	88.75	61.00	41.00	0.73	11.40
52	10	MI4S22E16	3.80	0.00	0.00	0.60	0.40	1.20	0.00	0.00	6.30	0.00	0.00	0.00	97.50	89.50	61.50	42.00	0.70	12.80
53	10	MI4S22E18	3.86	0.00	0.00	0.71	0.43	1.21	0.00	0.00	6.93	0.00	0.00	0.00	96.79	89.64	62.14	41.79	0.68	13.07
54	10	MI4S22E19	3.89	0.00	0.00	0.78	0.44	1.20	0.00	0.00	7.11	0.00	0.00	0.00	96.50	90.00	65.28	44.72	0.67	13.78
55	10	MI4S22E20	4.00	0.00	0.00	0.80	0.44	1.20	0.00	0.00	6.90	0.00	0.00	0.00	96.50	89.50	61.00	41.50	0.65	13.00
56	10	MI4S22E22	4.11	0.09	0.13	0.33	0.22	1.78	0.00	0.00	6.39	0.00	0.00	0.56	96.39	89.72	61.11	36.39	0.72	10.56
57	10	MI4S22E23	3.43	0.29	0.29	0.00	0.29	1.86	0.29	0.00	8.57	0.00	0.00	0.83	97.08	89.17	62.50	35.83	1.04	9.00
58	10	MI4S22E31	4.38	0.13	0.13	0.00	0.13	2.44	0.13	0.00	4.50	0.00	0.00	0.31	98.75	96.88	61.25	26.25	0.75	5.31
59	10	MI4S22E33	3.93	0.14	0.00	0.14	0.29	2.14	0.14	0.14	6.25	0.00	0.00	0.00	98.75	96.61	65.71	35.36	0.91	9.39
60	10	MI4S22E35	3.00	0.50	0.40	0.00	0.40	1.10	0.50	0.00	7.25	0.00	0.00	0.56	98.06	94.17	63.89	36.94	1.50	10.61

OBS	BD1	PERM1	AWC1	CEC1	SALIN1	LAYDEP2	SHRINK2	INCH102	INCH32	N042	N0102	N0402	N02002	OM2	CLAY2	BD2	PERM2	AWC2	CEC2	SALIN2
31	1.54	4.00	0.13	7.50	0.00	40.57	0.00	0.00	0.00	97.17	94.83	71.17	53.17	0.25	15.83	1.55	2.97	0.14	8.83	0.13
32	1.56	3.28	0.11	8.23	0.00	30.90	0.27	0.00	0.00	96.21	92.54	70.25	42.88	0.22	18.47	1.56	3.00	0.09	10.63	0.00
33	1.55	3.63	0.12	8.79	1.50	35.10	0.29	0.00	0.21	98.16	94.34	72.56	48.96	0.25	18.24	1.55	3.11	0.12	11.40	1.82
34	1.58	7.00	0.11	6.90	0.78	35.36	0.00	0.00	0.00	98.06	95.56	65.59	38.89	0.25	10.69	1.58	6.57	0.11	6.56	1.04
35	1.55	2.65	0.12	8.75	0.00	33.75	0.17	0.00	0.00	96.04	93.96	72.08	43.33	0.23	19.50	1.54	2.37	0.09	10.83	0.00
36	1.56	4.60	0.12	7.58	0.00	34.54	0.00	0.00	0.00	98.75	96.67	68.96	37.08	0.25	13.92	1.54	4.60	0.09	8.04	0.00
37	1.57	5.15	0.11	7.14	0.00	34.86	0.03	0.00	0.23	96.67	92.20	64.51	39.96	0.25	12.40	1.56	5.08	0.10	7.52	0.15
38	1.54	3.40	0.12	8.33	0.00	36.22	0.04	0.00	0.00	96.76	92.69	66.02	44.07	0.25	14.54	1.54	3.32	0.11	8.15	0.13
39	1.54	3.33	0.12	8.75	0.00	33.93	0.00	0.00	0.00	95.63	92.50	68.44	42.19	0.25	15.25	1.53	3.33	0.08	8.75	0.00
40	1.55	2.65	0.12	8.75	0.00	34.98	0.08	0.00	0.00	95.31	89.06	66.51	43.70	0.24	16.09	1.53	2.80	0.09	8.96	0.00
41	1.57	4.51	0.11	7.21	0.00	35.20	0.05	0.00	0.00	97.14	93.21	66.19	40.12	0.24	12.86	1.56	4.60	0.09	7.45	0.00
42	1.55	4.13	0.12	8.29	0.00	32.24	0.07	0.00	0.00	97.14	93.21	68.75	40.54	0.25	14.46	1.54	4.06	0.08	8.64	0.00
43	1.56	4.63	0.12	7.55	0.00	36.28	0.00	0.00	0.00	96.46	93.79	66.96	43.83	0.25	13.59	1.55	4.31	0.11	7.97	0.17
44	1.58	7.00	0.11	6.90	0.00	35.75	0.00	0.00	0.00	97.50	95.42	65.42	40.83	0.25	11.04	1.57	5.93	0.10	6.79	0.17
45	1.59	8.70	0.10	5.78	0.00	33.34	0.00	0.00	0.00	98.70	97.13	67.59	38.43	0.25	10.77	1.58	6.84	0.10	6.77	0.19
46	1.61	8.70	0.10	5.28	0.11	33.44	0.00	0.00	0.00	98.89	97.50	64.72	30.83	0.25	8.08	1.59	8.70	0.09	5.56	0.17
47	1.55	1.68	0.13	9.17	0.00	32.88	0.54	0.00	0.00	96.34	90.05	68.43	47.87	0.21	21.99	1.60	1.23	0.09	11.94	0.00
48	1.56	4.88	0.11	10.13	0.59	31.86	0.32	0.00	0.00	98.19	94.64	70.44	44.53	0.27	18.79	1.55	3.14	0.08	10.80	0.07
49	1.55	2.65	0.11	8.09	0.13	33.04	0.00	0.00	0.00	96.98	91.93	69.06	46.02	0.27	18.99	1.56	2.17	0.09	11.51	0.72
50	1.56	4.84	0.11	7.88	1.13	35.52	0.04	0.17	1.67	93.42	88.33	63.94	39.61	0.43	11.53	1.57	4.86	0.10	7.56	1.40
51	1.56	3.82	0.12	8.55	0.00	35.53	0.10	0.00	0.25	95.50	88.50	63.29	41.04	0.24	13.74	1.56	4.00	0.09	7.63	0.00
52	1.56	1.84	0.12	8.50	0.00	30.28	0.33	0.00	0.00	95.75	88.75	68.92	46.17	0.21	19.95	1.56	1.84	0.09	10.33	0.00
53	1.56	2.07	0.12	8.93	0.00	30.26	0.15	0.00	0.00	95.60	89.40	69.35	44.70	0.23	18.75	1.54	2.08	0.09	10.26	0.00
54	1.55	2.20	0.13	9.70	0.00	30.68	0.15	0.00	0.00	95.46	89.54	69.49	44.21	0.23	18.36	1.53	2.21	0.09	10.28	0.00
55	1.56	2.38	0.12	9.50	0.00	29.28	0.07	0.00	0.00	95.00	89.00	69.25	43.75	0.25	17.55	1.52	2.50	0.09	10.00	0.00
56	1.58	5.10	0.11	7.33	0.00	35.13	0.11	0.00	0.56	95.46	89.00	64.35	37.41	0.33	13.50	1.57	5.04	0.09	7.89	0.00
57	1.58	6.55	0.10	6.21	0.14	35.44	0.06	0.00	0.83	95.83	89.17	62.22	34.72	0.33	9.94	1.59	6.65	0.11	6.28	0.33
58	1.63	10.75	0.09	4.13	0.13	34.00	0.00	0.00	0.00	98.75	96.88	61.88	25.94	0.25	5.16	1.63	10.75	0.09	4.13	0.13
59	1.58	6.64	0.11	6.43	0.14	34.39	0.02	0.00	0.00	98.75	96.61	67.56	35.60	0.28	11.02	1.57	6.04	0.09	6.57	0.21
60	1.57	6.00	0.10	6.60	1.20	35.92	0.00	0.00	0.56	98.06	94.17	66.11	33.28	0.44	9.47	1.58	6.70	0.10	6.83	1.61

OBS	CO	MTRS	DRAIN	WATTAB	FLOOD	PAN	HYD	SLOPE	WATSOIL	BEDROCK	LAYDEP1	SHRINK1	INCH101	INCH31	N041	N0101	N0401	N02001	OM1	CLAY1
61	10	MI4S23E15	3.73	0.27	0.27	0.00	0.09	1.18	0.27	0.00	4.77	0.00	0.23	2.05	94.77	90.23	61.59	34.55	1.41	9.23
62	10	MI4S23E22	4.33	0.00	0.17	0.00	0.00	1.17	0.00	0.00	6.00	0.00	0.42	3.33	91.67	86.67	56.67	33.33	0.75	9.17
63	10	MI4S23E26	3.63	0.00	0.00	0.13	0.00	5.00	0.00	0.00	9.13	0.50	0.63	0.63	95.63	91.88	72.50	52.81	1.16	24.81
64	10	MI4S23E28	3.50	0.25	0.25	0.00	0.00	1.13	0.38	0.00	5.00	0.00	0.31	2.50	94.06	89.69	61.88	35.63	1.78	10.19
65	10	MI4S23E32	3.25	0.38	0.25	0.00	0.00	1.13	0.50	0.00	4.00	0.00	0.31	2.50	95.00	90.94	63.13	35.00	2.13	10.25
66	10	MI4S23E33	3.71	0.14	0.14	0.00	0.00	1.14	0.29	0.00	5.14	0.00	0.36	2.86	93.21	88.57	60.36	34.64		

83	10	MI5S21E15	4.33	0.00	0.11	0.22	0.22	2.22	0.00	0.00	5.78	0.00	0.00	0.28	97.78	94.72	64.44	37.50	0.72	9.72
84	10	MI5S21E17	4.20	0.10	0.00	0.00	0.10	2.10	0.10	0.10	4.65	0.00	0.00	0.00	98.75	97.75	64.25	32.75	0.75	7.75
85	10	MI5S21E24	4.00	0.18	0.09	0.09	0.18	2.00	0.18	0.00	5.00	0.00	0.00	0.23	98.44	95.91	65.00	34.32	0.98	8.45
86	10	MI5S21E24	4.38	0.00	0.00	0.00	0.00	1.75	0.00	0.00	5.38	0.00	0.00	0.00	98.44	96.88	62.19	34.69	0.75	8.75
87	10	MI5S22E03	4.33	0.11	0.00	0.00	0.11	2.33	0.11	0.00	5.33	0.00	0.00	0.28	98.89	97.22	61.67	26.67	0.75	5.67
88	10	MI5S22E05	4.30	0.00	0.00	0.20	0.20	3.45	0.00	0.00	5.60	0.00	0.00	0.25	97.75	95.00	66.00	37.50	0.70	10.00
89	10	MI5S22E06	4.17	0.00	0.00	0.17	0.17	3.33	0.00	0.33	5.58	0.00	0.00	0.42	97.08	93.75	67.92	40.00	0.71	11.25
90	10	MI5S22E07	4.13	0.13	0.13	0.13	0.25	1.75	0.13	0.00	5.25	0.00	0.00	0.31	98.13	95.31	65.63	34.69	0.72	8.13

OBS	BD1	PERM1	AWC1	CEC1	SALIN1	LAYDEP2	SHRINK2	INCH102	INCH32	N042	N0102	N0402	N02002	OM2	CLAY2	BD2	PERM2	AWC2	CEC2	SALIN2
61	1.58	7.27	0.11	6.77	0.09	36.80	0.00	0.23	1.36	92.12	86.74	60.64	33.26	0.36	9.49	1.58	7.16	0.10	6.58	0.33
62	1.58	7.00	0.11	6.00	0.00	39.25	0.00	0.42	2.08	86.67	80.00	52.92	29.38	0.25	9.17	1.58	7.00	0.10	6.00	0.00
63	1.51	6.68	0.14	18.13	0.25	39.97	0.90	0.00	0.00	97.40	95.42	75.26	54.01	0.36	29.69	1.55	1.34	0.11	20.42	0.25
64	1.58	6.25	0.11	7.31	0.13	36.81	0.00	0.31	3.13	86.72	80.94	57.19	32.02	0.41	9.53	1.58	6.81	0.10	6.88	0.38
65	1.58	6.25	0.11	7.63	0.88	35.63	0.00	0.31	3.13	90.16	85.16	61.09	34.22	0.47	9.59	1.58	6.48	0.10	7.19	1.13
66	1.58	6.57	0.11	6.93	0.14	36.71	0.00	0.36	3.57	86.61	80.18	55.71	30.18	0.36	9.04	1.59	7.21	0.10	6.43	0.29
67	1.58	5.25	0.10	6.54	0.00	35.10	0.26	0.00	0.38	96.12	92.53	66.47	39.74	0.24	15.87	1.61	4.73	0.09	9.47	0.04
68	1.50	1.35	0.13	18.13	0.13	33.65	0.96	0.00	0.00	98.23	95.52	77.19	55.94	0.42	30.71	1.56	0.81	0.10	20.73	0.38
69	1.46	1.61	0.15	21.07	0.36	36.45	1.07	0.00	0.00	97.77	96.07	78.30	55.27	0.41	30.86	1.50	1.23	0.10	23.04	0.64
70	1.55	6.28	0.12	12.68	0.21	38.40	0.44	0.00	0.71	95.39	93.01	69.61	40.15	0.35	18.73	1.54	4.72	0.11	12.58	0.29
71	1.48	1.76	0.13	18.96	1.92	35.26	0.90	0.00	0.00	97.67	96.39	78.58	54.93	0.36	28.48	1.53	0.95	0.10	19.10	2.08
72	1.49	1.70	0.13	17.25	1.20	34.49	0.80	0.00	0.00	97.63	95.39	74.47	51.54	0.35	27.22	1.57	0.97	0.08	17.64	1.40
73	1.60	8.50	0.10	5.25	0.10	33.93	0.00	0.00	0.00	98.71	97.54	65.46	35.33	0.25	8.67	1.60	8.18	0.10	5.67	0.27
74	1.60	8.23	0.10	5.25	0.10	32.76	0.00	0.00	0.00	98.83	97.42	65.58	33.33	0.25	8.94	1.59	8.10	0.10	5.92	0.27
75	1.60	8.50	0.10	5.25	0.00	33.72	0.00	0.00	0.00	98.89	97.78	64.31	34.72	0.25	8.19	1.60	8.29	0.10	5.57	0.19
76	1.59	8.00	0.11	5.50	0.11	34.21	0.00	0.00	0.00	98.80	97.59	65.06	36.02	0.25	9.12	1.59	7.71	0.11	5.87	0.37
77	1.60	8.50	0.10	5.50	0.13	33.31	0.00	0.00	0.00	98.75	97.81	64.06	31.88	0.25	7.66	1.60	8.50	0.09	5.25	0.25
78	1.59	7.47	0.11	5.93	0.14	33.18	0.00	0.00	0.00	98.57	96.79	65.36	33.21	0.25	9.68	1.58	7.47	0.10	6.29	0.29
79	1.56	4.45	0.12	7.56	0.00	34.51	0.00	0.00	0.00	97.92	95.21	67.92	41.67	0.25	14.02	1.54	4.29	0.11	8.40	0.21
80	1.58	6.16	0.11	6.25	0.00	33.13	0.00	0.00	0.25	97.75	95.00	67.00	35.75	0.25	11.30	1.57	6.16	0.09	7.15	0.05
81	1.61	8.70	0.10	5.28	0.11	34.06	0.00	0.00	0.56	97.78	94.17	63.06	29.17	0.25	8.08	1.58	8.70	0.09	5.56	0.17
82	1.58	7.00	0.11	6.00	0.00	37.46	0.00	0.00	0.83	96.46	91.46	62.71	36.67	0.25	10.21	1.58	6.68	0.11	6.42	0.08
83	1.58	6.40	0.11	6.56	0.00	34.22	0.00	0.00	0.28	97.78	94.72	65.06	35.00	0.25	11.17	1.56	6.40	0.10	7.11	0.11
84	1.60	8.50	0.10	5.25	0.10	34.11	0.00	0.00	0.00	98.83	97.92	66.58	36.33	0.25	9.17	1.60	7.73	0.10	5.89	0.27
85	1.59	7.85	0.10	5.11	1.18	33.77	0.00	0.00	0.23	98.41	95.91	64.77	32.73	0.30	8.93	1.59	7.60	0.09	6.14	1.23
86	1.59	7.38	0.11	5.81	0.00	35.01	0.00	0.00	0.00	98.54	97.08	63.85	36.67	0.25	9.27	1.59	7.21	0.11	6.02	0.21
87	1.62	10.00	0.09	4.50	0.11	34.94	0.00	0.00	0.28	98.89	97.22	62.08	26.67	0.25	5.75	1.62	10.00	0.09	4.25	0.10
88	1.58	6.16	0.11	6.65	0.00	34.15	0.00	0.00	0.25	97.75	95.00	67.00	35.75	0.25	11.30	1.57	6.16	0.09	7.15	0.10
89	1.56	5.05	0.12	7.17	0.00	35.29	0.00	0.00	0.42	98.08	93.75	67.08	37.92	0.25	12.33	1.56	5.05	0.08	7.58	0.00
90	1.59	8.16	0.11	5.56	0.13	34.31	0.00	0.00	0.31	97.13	95.31	63.75	30.94	0.25	8.78	1.59	8.16	0.09	5.88	0.19

OBS	CO	MFRS	DRAIN	WATTAB	FLOOD	PAN	HYD	SLOPE	WATSOIL	BEDROCK	LAYDEP1	SHRINK1	INCH101	INCH31	N041	N0101	N0401	N02001	OM1	CLAY1
91	10	MI5S22E08	4.33	0.00	0.11	0.22	0.22	2.22	0.00	0.00	6.22	0.00	0.00	0.28	97.22	93.61	64.17	37.50	0.69	9.72
92	10	MI5S22E09	4.22	0.00	0.11	0.22	0.22	1.17	0.00	0.00	5.94	0.00	0.00	0.28	97.22	93.61	63.06	36.39	0.69	9.72
93	10	MI5S22E11	4.22	0.11	0.11	0.22	0.22	1.72	0.11	0.00	4.89	0.00	0.00	0.56	97.78	94.17	63.33	31.39	0.72	7.50
94	10	MI5S22E15	4.17	0.17	0.17	0.00	0.17	1.25	0.13	0.00	4.83	0.00	0.00	0.42	98.33	95.83	61.67	28.33	0.75	6.25
95	10	MI5S22E16	4.25	0.13	0.13	0.00	0.13	1.81	0.13	0.00	5.06	0.00	0.00	0.31	97.81	95.31	62.19	29.69	0.75	6.56
96	10	MI5S22E17	4.38	0.00	0.13	0.25	0.25	2.44	0.00	0.00	6.00	0.00	0.00	0.31	97.19	93.44	64.38	36.88	0.69	9.38
97	10	MI5S22E18	4.38	0.13	0.13	0.00	0.13	2.44	0.13	0.00	4.50	0.00	0.00	0.31	98.75	96.88	61.25	26.25	0.75	5.31
98	10	MI5S22E19	4.67	0.00	0.17	0.00	0.00	2.08	0.00	0.00	4.75	0.00	0.00	0.42	98.33	95.83	60.83	28.33	0.75	5.83
99	10	MI5S22E20	4.40	0.10	0.10	0.00	0.10	2.65	0.10	0.00	4.20	0.00	0.00	0.50	98.25	95.75	62.75	27.75	0.75	5.75
100	10	MI5S22E21	4.17	0.17	0.17	0.00	0.17	2.00	0.17	0.00	4.83	0.00	0.00	0.42	98.33	95.83	63.33	30.00	0.75	6.25
101	10	MI5S22E22	4.00	0.20	0.20	0.00	0.20	2.10	0.20	0.00	5.10	0.00	0.00	0.50	98.00	95.00	61.00	29.00	0.75	7.00
102	10	MI5S22E30	4.38	0.13	0.13	0.00	0.13	2.44	0.13	0.00	5.31	0.00	0.00	0.63	98.13	95.00	61.25	26.25	0.75	5.31
103	10	MI5S22E32	4.43	0.00	0.14	0.00	0.60	1.21	0.00	0.00	5.14	0.00	0.00	0.36	97.86	95.00	60.71	32.86	0.75	8.21
104	10	MI5S22E33	4.29	0.00	0.14	0.14	0.14	1.14	0.00	0.00	6.07	0.00	0.00	0.36	96.79	92.86	64.64	38.57	0.71	10.00
105	10	MI5S22E01	3.64	0.09	0.09	0.36	0.18	1.68	0.09	0.00	8.32	0.18	0.00	0.00	97.95	93.18	66.59	43.86	0.91	14.82
106	10	MI5S23E02	3.18	0.18	0.06	0.35	0.47	2.76	0.24	0.06	6.50	0.18	0.00	0.00	97.50	93.09	71.32	47.79	1.22	16.68
107	10	MI5S23E06	3.78	0.44	0.44	0.00	0.22	2.33	0.44	0.11	4.44	0.00	0.00	0.83	96.94	93.33	61.94	32.78	1.28	9.22
108	10	MI5S23E07	3.82	0.09	0.09	0.36	0.27	2.55	0.09	0.09	6.41	0.00	0.00	0.23	97.05	93.64	67.05	42.73	0.95	12.77
109	10	MI5S23E12	3.90	0.00	0.10	0.40	0.20	2.25	0.00	0.10	7.55	0.00	0.00	0.00	97.75	93.75	66.00	38.25	0.75	11.10
110	10	MI5S23E32	4.50	0.10	0.10	0.00	0.10	3.05	0.00	0.00	7.48	0.00	0.00	0.50	97.75	94.50	61.50	31.25	0.75	7.75
111	10	MI5S24E01	3.00	0.13	0.13	0.20	0.35	3.06	0.13	0.00	7.48	0.25	0.00	0.00	97.81	94.18	73.47	49.29	1.19	19.88
112	10	MI5S24E02	3.50	0.12	0.06	0.20	0.35	2.32	0.12	0.06	7.67	0.24	0.00	0.15	97.65	93.88	71.19	48.64	1.19	17.56

97	1.63	10.75	0.09	4.13	0.13	34.00	0.00	0.00	0.00	0.31	98.75	96.88	61.88	25.94	0.25	5.16	1.63	10.75	0.09	4.13	0.13
98	1.62	10.00	0.09	4.50	0.00	35.88	0.00	0.00	0.00	0.42	98.33	95.83	64.17	32.92	0.25	7.71	1.61	8.93	0.10	5.29	0.00
99	1.62	10.30	0.09	4.35	0.10	34.38	0.00	0.00	0.00	0.50	98.25	95.75	64.00	29.50	0.25	6.75	1.62	9.66	0.08	4.83	0.10
101	1.61	10.00	0.10	4.50	0.17	35.58	0.00	0.00	0.00	0.42	98.33	95.83	61.67	27.08	0.25	6.04	1.62	10.00	0.09	4.50	0.17
102	1.63	9.40	0.09	4.80	0.20	34.34	0.00	0.00	0.00	0.50	98.00	95.00	61.50	28.00	0.25	6.75	1.61	9.40	0.09	4.80	0.20
103	1.59	10.75	0.10	4.13	0.13	34.34	0.00	0.00	0.00	0.63	98.13	95.00	60.94	25.00	0.25	5.16	1.63	10.75	0.08	4.13	0.13
104	1.57	7.86	0.10	5.37	0.86	35.58	0.00	0.00	0.00	0.36	97.98	95.24	63.92	34.76	0.25	8.81	1.59	7.86	0.10	5.81	0.93
105	1.54	6.19	0.12	6.57	0.00	36.07	0.00	0.00	0.00	0.36	97.32	93.75	65.89	38.57	0.25	11.82	1.56	5.91	0.11	7.29	0.07
106	1.54	4.30	0.12	11.68	0.00	36.07	0.35	0.00	0.00	0.00	97.20	93.03	66.36	44.66	0.28	17.95	1.55	2.62	0.10	10.27	0.09
107	1.58	7.66	0.13	12.09	0.06	32.76	0.58	0.00	0.00	0.00	97.11	93.19	72.18	49.46	0.32	22.82	1.57	2.37	0.10	14.44	0.29
108	1.58	2.00	0.10	6.56	0.11	35.64	0.00	0.00	0.00	0.83	96.94	93.33	64.72	31.11	0.36	8.31	1.60	8.00	0.09	6.06	0.33
109	1.55	4.08	0.12	8.45	0.00	35.76	0.00	0.00	0.00	0.23	97.05	93.64	69.47	42.20	0.29	15.02	1.55	3.86	0.10	9.14	0.15
110	1.58	4.22	0.11	7.85	0.00	34.83	0.26	0.00	0.00	0.00	96.83	93.42	66.88	40.63	0.23	15.18	1.58	3.72	0.09	8.21	0.00
111	1.60	8.23	0.10	5.50	0.00	33.33	0.70	0.00	0.00	0.50	97.75	94.50	63.75	31.00	0.25	8.40	1.59	8.23	0.09	5.75	0.05
112	1.51	1.83	0.13	14.38	0.00	33.50	0.75	0.00	0.00	0.00	96.56	94.56	72.87	51.61	0.31	27.68	1.59	1.07	0.09	17.21	0.13
113	1.52	2.96	0.13	14.15	1.00	35.49	0.45	0.00	0.00	0.06	97.55	94.59	70.76	48.04	0.35	20.61	1.54	2.25	0.10	13.05	1.12
114	1.54	4.64	0.12	10.93	0.00	35.41	0.44	0.00	0.00	0.16	96.93	93.07	67.71	44.11	0.38	19.43	1.56	3.08	0.09	12.06	0.13
115	1.51	3.14	0.12	10.97	0.00	34.99	0.57	0.00	0.00	0.00	97.19	93.84	70.99	48.02	0.32	22.38	1.56	2.10	0.09	14.49	0.25
116	1.51	2.18	0.13	14.32	0.27	33.53	0.77	0.00	0.00	0.00	97.12	93.11	72.88	50.87	0.32	25.92	1.54	1.56	0.09	18.07	0.55
117	1.46	1.83	0.14	15.94	0.38	32.71	0.90	0.00	0.00	0.00	97.29	94.58	74.53	52.03	0.31	28.84	1.56	0.90	0.09	19.48	0.63
118	1.56	4.09	0.12	8.80	0.00	35.74	0.50	0.00	0.00	0.25	95.92	91.33	68.17	44.17	0.23	20.00	1.57	3.51	0.08	13.80	0.20
119	1.49	2.01	0.14	16.25	0.00	33.11	0.67	0.00	0.00	0.00	96.94	93.06	70.28	51.32	0.31	24.96	1.56	1.69	0.08	15.83	0.17
120	1.51	2.37	0.13	13.33	0.00	35.87	0.68	0.00	0.00	0.00	97.13	92.59	67.50	48.75	0.29	21.10	1.56	2.23	0.10	12.96	0.11
120	1.59	7.60	0.10	6.20	0.00	37.40	0.00	0.00	0.00	0.25	96.50	93.75	62.00	33.75	0.25	9.25	1.58	6.70	0.09	5.48	0.00

OBS	CO	MFRS	DRAIN	WATTAB	FLOOD	PAN	HYD	SLOPE	WATSOIL	BEDROCK	LAYDEP1	SHRINK1	INCH101	INCH31	N041	N0101	N0401	N02001	OMI	CLAY1
121	10	MI5S24E33	4.00	0.00	0.10	0.20	0.30	2.40	0.00	0	8.20	0.40	0.00	0.75	94.75	88.75	68.50	47.50	1.08	19.10
122	10	MI5S24E36	3.71	0.00	0.00	0.64	0.43	1.14	0.00	0	7.93	0.00	0.00	0.00	96.43	91.61	68.21	45.89	0.71	13.57
123	10	MI6S18E21	1.50	0.00	0.00	0.00	0.50	1.00	0.00	0	6.38	0.00	0.00	0.00	100.00	98.13	73.13	47.50	2.38	16.38
124	10	MI6S19E02	4.44	0.00	0.00	0.00	0.00	1.72	0.00	0	4.83	0.00	0.00	0.00	98.61	97.22	63.89	33.61	0.75	8.44
125	10	MI6S19E14	4.57	0.00	0.00	0.00	0.00	1.25	0.00	0	5.17	0.00	0.00	0.00	98.75	97.50	67.08	33.33	0.75	8.67
126	10	MI6S19E23	4.57	0.00	0.00	0.00	0.00	1.93	0.00	0	5.21	0.00	0.00	0.00	98.93	97.86	68.57	32.14	0.75	8.29
127	10	MI6S20E22	4.30	0.10	0.00	0.00	0.10	2.15	0.10	0	4.85	0.00	0.00	0.00	98.50	97.25	62.50	30.00	0.75	6.75
128	10	MI6S21E04	4.25	0.13	0.00	0.00	0.13	2.38	0.13	0	4.94	0.00	0.00	0.00	99.06	98.13	62.19	29.06	0.75	6.56
129	10	MI6S21E05	4.25	0.13	0.00	0.00	0.13	2.38	0.13	0	4.94	0.00	0.00	0.00	99.06	98.13	62.19	29.06	0.75	6.56
130	10	MI6S21E07	4.22	0.11	0.00	0.00	0.11	2.22	0.11	0	5.00	0.00	0.00	0.00	98.33	96.94	62.22	30.56	0.75	7.22
131	10	MI6S21E16	4.43	0.00	0.00	0.00	0.00	1.20	0.00	0	5.20	0.00	0.00	0.00	98.50	97.00	61.50	33.50	0.75	8.50
132	10	MI6S21E21	4.43	0.00	0.00	0.00	0.11	1.21	0.00	0	5.29	0.00	0.00	0.00	98.57	97.14	63.93	33.57	0.75	8.71
133	10	MI6S21E33	4.11	0.11	0.00	0.00	0.11	1.67	0.11	0	4.67	0.00	0.00	0.00	98.61	97.22	63.06	33.61	0.75	8.33
134	10	MI6S21E34	3.75	0.08	0.00	0.25	0.25	1.50	0.08	0	4.83	0.00	0.00	0.00	98.33	96.46	65.00	35.83	0.75	9.58
135	10	MI6S21E36	4.50	0.00	0.00	0.00	0.00	1.25	0.00	0	5.31	0.00	0.00	0.00	98.75	97.50	66.25	33.44	0.75	8.38
136	10	MI6S22E01	4.20	0.00	0.20	0.00	0.00	1.10	0.00	0	6.30	0.00	0.00	0.50	96.00	91.50	61.00	38.00	0.75	10.50
137	10	MI6S22E02	4.57	0.00	0.14	0.00	0.00	1.93	0.00	0	4.86	0.00	0.00	0.36	98.21	95.71	61.07	30.36	0.75	6.79
138	10	MI6S22E03	4.38	0.13	0.13	0.00	0.13	2.44	0.13	0	4.50	0.00	0.00	0.31	98.75	96.88	61.25	26.25	0.75	5.31
139	10	MI6S22E11	4.50	0.00	0.17	0.00	0.00	1.25	0.00	0	5.08	0.00	0.00	0.42	97.92	95.00	60.42	31.25	0.75	7.50
140	10	MI6S22E21	4.00	0.20	0.10	0.00	0.11	1.70	0.20	0	7.20	0.00	0.00	0.28	98.61	96.39	63.33	31.11	0.95	7.28
141	10	MI6S22E33	4.33	0.11	0.11	0.00	0.11	2.28	0.11	0	4.61	0.00	0.00	0.28	98.61	96.67	61.39	28.06	0.75	6.11
142	10	MI6S22E34	4.4	0.00	0.00	0.14	0.14	1.14	0.00	0	5.02	0.00	0.00	0.00	98.57	96.43	61.79	34.64	0.71	9.71
143	10	MI7S19E22	1.83	0.00	0.00	0.00	0.50	1.00	0.83	0	6.00	0.00	0.00	0.00	100.00	99.17	82.08	59.17	1.88	19.42
144	10	MI7S19E35	2.00	0.00	0.00	0.00	0.00	1.06	0.83	0	6.25	0.00	0.00	0.00	99.58	97.50	74.17	49.58	2.54	15.42
145	10	MI7S22E05	3.67	0.00	0.00	0.22	0.22	1.06	0.00	0	5.44	0.00	0.00	0.00	98.33	96.11	66.11	40.56	0.75	11.39
146	11	MI8N01W06	3.38	0.63	0.50	0.00	0.25	2.06	0.50	0	5.44	0.38	0.31	1.88	89.06	86.56	75.31	55.00	1.51	17.94
147	11	MI8N01W07	3.17	0.78	0.44	0.11	0.50	1.53	0.44	0	5.78	0.44	0.00	0.28	89.44	86.94	86.67	66.39	1.83	21.67
148	11	MI8N02W06	2.67	0.67	0.00	0.36	0.67	0.83	0.00	0	6.17	1.00	0.00	0.00	100.00	100.00	97.50	90.00	2.17	35.33
149	11	MI8N02W06	1.73	0.91	0.18	0.36	1.00	0.77	0.55	0	8.77	1.36	0.00	0.23	97.05	96.14	91.14	80.23	1.52	39.09
150	11	MI8N02W12	2.67	0.67	0.00	0.00	0.67	0.83	0.00	0	6.17	1.00	0.00	0.00	100.00	100.00	97.50	89.17	2.33	35.33

OBS	BD1	PERM1	AWC1	CEC1	SALIN1	LAYDEP2	SHRINK2	INCH102	INCH32	N042	N0102	N0402	N02002	OM2	CLAY2	BD2	PERM2	AWC2	CEC2	SALIN2
121	1.52	3.86	0.13	15.05	0.20	38.64	0.68	0.00	0.25	95.00	90.00	70.71	47.71	0.35	23.67	1.52	3.34	0.11	17.47	0.30
122	1.54	2.65	0.13	9.29	0.00	34.60	0.43	0.00	0.00	96.13	91.55	70.42	46.31	0.23	21.12	1.55	2.20	0.08	13.57	0.14
123	1.51	1.98	0.13	18.13	4.25	37.60	0.33	0.00	0.00	100.00	98.75	74.17	45.21	0.47	17.54	1.52	0.72	0.13	12.19	4.25
124	1.59	8.00	0.10	5.50	1.56	34.84	0.00	0.00	0.00	98.98	97.96	67.90	38.98	0.25	10.10	1.52	7.43	0.10	6.24	1.76
125	1.60	9.50	0.00	5.25	1.67	37.04	0.00	0.00	0.00	99.17	98.33	72.56	43.54	0.25						

144	1.51	3.10	0.14	17.92	1.67	35.81	0.17	0.00	0.00	99.72	98.19	72.22	44.72	0.63	15.53	1.53	1.84	0.13	10.69	1.94
145	1.54	4.40	0.10	7.00	4.00	35.00	0.00	0.00	0.00	98.70	96.85	71.80	47.04	0.22	14.87	1.54	3.70	0.10	8.30	4.20
146	1.53	4.45	0.13	15.79	0.00	35.56	0.56	0.31	1.88	87.81	85.31	69.38	51.41	0.32	20.81	1.55	5.02	0.11	15.61	0.43
147	1.48	2.40	0.15	16.72	0.22	36.41	0.67	0.00	0.28	86.67	84.44	80.69	60.83	0.34	24.39	1.52	3.11	0.12	16.03	1.22
148	1.45	0.61	0.15	31.67	2.00	35.25	1.83	0.00	0.00	100.00	100.00	96.67	91.25	0.68	46.83	1.44	0.33	0.14	36.25	2.67
149	1.40	0.32	0.11	30.68	7.18	39.36	1.50	0.00	0.34	96.02	95.11	87.61	74.43	0.37	39.82	1.41	0.16	0.11	31.02	8.27
150	1.45	0.61	0.15	31.67	2.00	33.67	1.67	0.00	0.00	100.00	100.00	95.00	90.83	0.65	43.67	1.45	0.52	0.15	34.17	2.67

OBS	CO	MFRS	DRAIN	WATTAB	FLOOD	PAN	HYD	SLOPE	WATSOIL	BEDROCK	LAYDEP1	SHRINK1	INCH101	INCH31	N041	N0101	N0401	N02001	OMI	CLAY1
151	11	MI8N03W05	2.29	0.57	0.29	0.00	1.00	0.86	0.57	0.00	8.64	1.00	0.00	0.00	99.29	98.57	91.79	78.93	1.21	34.71
152	11	MI8N03W07	2.71	0.43	0.14	0.00	0.86	1.00	0.43	0.00	9.86	1.43	0.00	0.00	99.64	99.29	93.93	83.21	1.64	38.29
153	11	MI8N03W10	1.43	0.86	0.43	0.00	1.00	0.64	0.86	0.00	8.71	1.43	0.00	0.00	100.00	100.00	94.29	84.29	1.39	40.79
154	11	MI8N03W18	3.14	0.29	0.00	0.00	0.86	1.07	0.29	0.00	10.21	1.43	0.00	0.00	99.29	98.57	93.57	83.21	1.50	37.43
155	11	MI8N04W01	4.00	0.00	0.00	0.00	0.75	1.38	0.00	0.00	10.58	1.50	0.00	0.00	99.38	98.75	94.38	81.88	1.69	36.13
156	11	MI8N01W19	3.00	0.75	0.75	0.00	0.25	1.50	0.75	0.00	5.88	0.25	0.00	0.00	100.00	98.13	88.13	63.13	1.69	18.25
157	11	MI8N02W08	3.67	0.50	0.50	0.00	0.17	3.08	0.50	0.00	5.33	0.50	0.42	2.08	86.25	84.58	76.25	57.50	1.63	17.42
158	11	MI8N02W07	2.14	0.79	0.00	0.29	0.93	0.96	0.29	0.00	7.64	1.07	0.00	0.36	95.00	92.86	87.50	75.71	1.73	34.89
159	11	MI8N02W09	2.25	0.75	0.00	0.50	1.00	0.94	0.13	0.00	6.81	0.88	0.00	0.31	95.31	93.44	87.50	75.00	1.84	32.69
160	11	MI8N02W09	1.56	1.00	0.00	0.78	1.00	0.72	0.33	0.00	8.17	1.22	0.00	0.28	96.39	95.00	88.33	75.83	1.97	37.83
161	11	MI8N02W19	3.08	0.42	0.00	0.00	0.67	1.13	0.17	0.00	7.25	1.08	0.00	1.04	87.29	85.00	79.17	70.00	1.67	34.46
162	11	MI8N02W22	1.33	1.00	0.00	0.00	1.00	0.67	0.50	0.00	8.92	1.50	0.00	0.00	100.00	98.75	94.58	84.17	2.00	42.00
163	11	MI8N02W23	1.83	0.83	0.00	0.33	1.00	1.58	0.17	0.00	7.17	1.17	0.00	0.00	100.00	99.17	96.67	87.50	1.92	38.08
164	11	MI8N02W28	2.13	0.75	0.00	0.38	0.88	0.88	0.38	0.00	7.63	0.88	0.00	0.31	95.31	93.13	88.44	76.88	1.63	33.00
165	11	MI8N02W35	1.80	1.00	0.00	0.00	1.00	0.70	0.20	0.00	7.30	1.20	0.00	0.00	100.00	99.50	96.50	90.00	1.90	38.20
166	11	MI8N02W36	2.00	1.00	0.00	0.00	1.00	0.67	0.00	0.00	6.50	1.00	0.00	0.00	100.00	100.00	97.50	90.00	2.20	37.50
167	11	MI8N03W04	3.40	0.20	0.00	0.00	0.80	1.10	0.20	0.00	10.30	1.50	0.00	0.00	100.00	100.00	96.00	88.50	2.20	43.20
168	11	MI8N03W06	4.00	0.00	0.00	0.00	1.00	2.25	0.00	0.00	12.00	1.50	0.00	0.00	98.75	98.13	93.75	83.75	1.44	35.00
169	11	MI8N03W07	4.00	0.00	0.00	0.00	1.00	2.25	0.00	0.00	9.25	0.75	0.00	0.00	98.13	96.25	90.00	74.38	0.94	28.38
170	11	MI8N03W08	3.00	0.33	0.00	0.00	1.00	1.08	0.33	0.00	11.17	1.50	0.00	0.00	99.17	98.33	92.92	82.50	1.42	38.50
171	11	MI8N03W09	2.00	0.67	0.00	0.00	1.00	0.83	0.67	0.00	12.50	2.00	0.00	0.00	100.00	100.00	95.00	90.00	1.83	50.00
172	11	MI8N03W10	3.25	0.25	0.00	0.00	0.75	1.00	0.25	0.00	9.25	1.75	0.00	0.00	100.00	100.00	96.25	88.75	2.38	45.25
173	11	MI8N03W12	2.71	0.57	0.00	0.00	0.71	1.00	0.14	0.00	8.14	1.43	0.00	0.36	95.36	93.57	90.00	80.71	1.64	38.07
174	11	MI8N03W17	2.29	0.57	0.14	0.00	1.00	0.86	0.57	0.00	9.79	1.29	0.00	0.00	99.29	98.21	92.86	81.43	1.39	38.50
175	11	MI8N03W18	4.00	0.00	0.00	0.00	1.00	1.33	0.00	0.00	9.83	1.43	0.00	0.00	98.33	96.67	90.83	75.00	1.40	32.00
176	11	MI8N03W22	1.14	1.00	0.43	0.00	0.80	0.57	0.86	0.00	8.14	1.43	0.00	0.50	100.00	100.00	94.64	84.64	1.39	40.79
177	11	MI8N03W25	3.29	0.40	0.00	0.00	1.00	1.10	0.00	0.00	8.20	1.60	0.00	0.50	93.50	92.00	88.00	79.50	1.80	41.40
178	11	MI8N03W36	1.67	0.83	0.17	0.00	1.00	0.75	0.67	0.00	10.58	1.83	0.00	0.00	100.00	100.00	95.42	88.33	1.63	46.83
179	11	MI9N04W01	4.00	0.00	0.00	0.00	0.56	2.11	0.00	0.00	8.39	1.22	0.00	0.00	99.17	98.61	95.00	83.61	1.83	32.50
180	11	MI9N04W12	4.00	0.00	0.00	0.00	0.83	1.92	0.00	0.00	9.50	1.00	0.00	0.00	98.75	97.50	92.08	78.75	1.38	29.92

OBS	BD1	PERM1	AWC1	CEC1	SALIN1	LAYDEP2	SHRINK2	INCH102	INCH32	N042	N0102	N0402	N02002	OM2	CLAY2	BD2	PERM2	AWC2	CEC2	SALIN2
151	1.43	0.38	0.13	27.14	4.14	37.96	1.79	0.00	0.00	98.75	98.04	93.04	83.93	0.39	42.36	1.40	0.08	0.11	32.50	5.00
152	1.41	0.35	0.14	30.00	3.29	39.86	1.79	0.00	0.00	99.64	99.29	93.93	87.32	0.48	43.79	1.39	0.25	0.12	33.93	4.43
153	1.40	0.20	0.10	32.14	9.00	38.71	1.79	0.00	0.00	100.00	100.00	95.00	86.61	0.43	43.79	1.39	0.07	0.10	34.64	9.86
154	1.40	0.47	0.15	29.29	2.43	39.36	1.86	0.00	0.00	98.75	98.04	93.04	85.71	0.49	44.89	1.39	0.18	0.12	34.64	3.43
155	1.41	0.39	0.17	26.88	0.00	40.50	1.75	0.00	0.00	99.38	98.75	93.33	86.88	0.53	42.75	1.39	0.40	0.13	31.88	0.75
156	1.49	1.30	0.16	12.50	0.00	35.88	0.25	0.00	0.00	100.00	98.13	79.38	54.38	0.28	18.25	1.54	3.33	0.12	10.00	0.45
157	1.52	3.25	0.14	14.00	0.00	35.33	0.33	0.42	2.08	88.75	86.67	70.42	51.67	0.24	17.42	1.55	4.60	0.11	11.50	0.40
158	1.43	0.67	0.15	26.61	2.00	37.80	1.29	0.00	0.71	92.14	89.91	83.66	69.73	0.32	33.52	1.43	0.97	0.14	25.11	2.89
159	1.42	0.75	0.14	25.00	2.00	36.95	1.19	0.00	0.63	90.00	87.66	80.00	66.41	0.21	31.03	1.43	1.51	0.13	22.22	2.69
160	1.38	0.55	0.13	30.28	5.56	38.56	1.39	0.00	0.42	94.58	92.64	83.75	68.19	0.21	35.89	1.40	0.24	0.12	26.94	6.67
161	1.45	0.88	0.14	26.04	0.50	37.52	1.29	0.00	1.77	84.90	82.50	76.77	66.77	0.42	35.73	1.43	1.77	0.13	25.15	1.54
162	1.39	0.37	0.14	33.33	3.67	39.33	1.58	0.00	0.00	99.58	97.92	91.46	77.08	0.24	38.08	1.40	0.22	0.13	29.79	5.50
163	1.43	0.36	0.13	36.25	4.33	35.39	1.75	0.00	0.00	100.00	98.96	94.38	82.29	0.60	45.42	1.44	0.18	0.12	37.71	5.17
164	1.44	0.75	0.14	25.31	2.25	37.25	1.25	0.00	0.47	94.22	92.34	86.25	72.81	0.26	33.44	1.43	0.28	0.14	25.31	3.13
165	1.42	0.29	0.13	35.00	4.00	35.92	1.70	0.00	0.00	100.00	99.50	93.25	81.25	0.57	44.50	1.44	0.18	0.12	36.75	4.80
166	1.45	0.31	0.13	37.50	4.00	32.75	2.00	0.00	0.00	100.00	100.00	96.67	90.83	0.80	50.00	1.45	0.13	0.12	42.50	4.33
167	1.39	0.34	0.15	34.00	1.90	40.30	1.80	0.00	0.00	100.00	100.00	95.00	89.00	0.54	46.20	1.38	0.34	0.15	35.50	2.80
168	1.41	0.42	0.16	28.75	0.00	41.06	1.75	0.00	0.00	99.38	99.38	95.63	88.13	0.63	45.25	1.38	0.16	0.16	34.69	0.75
169	1.45	0.78	0.17	20.63	0.00	36.88	1.75	0.00	0.00	96.25	94.38	89.38	78.75	0.38	40.25	1.41	0.13	0.11	36.48	0.25
170	1.40	0.34	0.14	30.83	2.83	40.38	1.92	0.00	0.00	98.54	97.71	92.71	85.42	0.50	45.92	1.38	0.09	0.11	36.46	4.00
171	1.35	0.06	0.11	41.67	5.67	42.50	2.00	0.00	0.00	100.00	100.00	95.00	90.00	0.58	50.00	1.35	0.06	0.11	41.67	7.67
172	1.39	0.40	0.15	35.00	1.50	39.25	1.75	0.00	0.00	100.00	100.00	95.00	89.38	0.49	45.25	1.35	0.40	0.15	34.38	3.25
173	1.43	0.67																		

187	11	M2ON03W20	3.25	0.25	0.00	0.00	0.88	1.13	0.00	0.00	8.19	1.25	0.00	0.00	97.19	95.94	90.31	79.69	1.28	33.31
188	11	M2ON03W25	3.83	0.17	0.00	0.00	0.83	1.33	0.00	0.00	4.50	0.17	0.00	0.83	85.42	80.83	70.83	52.50	1.21	19.25
189	11	M2ON03W33	3.40	0.20	0.00	0.00	1.00	1.40	0.20	0.00	8.30	1.60	0.00	0.00	100.00	100.00	96.50	88.50	2.30	42.40
190	11	M2ON03W36	3.60	0.20	0.00	0.00	1.00	1.40	0.00	0.00	4.60	0.00	0.00	2.00	93.00	90.00	79.00	61.50	1.30	20.30
191	15	M2GS24E32	4.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	6.25	0.50	0.00	0.00	93.00	92.00	73.75	55.00	0.50	21.50
192	15	M27S23E04	4.00	0.00	0.00	0.00	0.25	1.00	0.00	0.00	5.88	0.25	0.00	0.00	94.38	93.13	73.75	52.50	0.38	17.50
193	15	M27S23E04	4.00	0.00	0.00	0.00	0.25	1.00	0.00	0.00	5.25	0.25	0.00	0.00	96.25	95.00	75.63	52.50	0.50	17.38
194	15	M28S25E14	4.00	0.00	0.00	0.00	0.50	1.00	0.00	0.00	9.50	0.00	0.00	0.00	90.00	87.50	57.50	36.25	0.25	12.50
195	15	M28S25E24	4.00	0.00	0.00	0.00	0.50	1.00	0.00	0.00	9.50	0.00	0.00	0.00	90.00	87.50	57.50	36.25	0.25	12.50
196	15	S04N15W21	4.91	0.00	0.27	0.00	0.09	3.05	0.18	0.00	5.59	0.00	0.23	1.36	92.73	89.32	65.68	40.91	1.10	12.41
197	23	M15N12W16	3.80	0.03	0.20	0.00	0.37	2.95	0.20	0.00	8.82	0.10	0.00	1.46	84.84	79.42	64.13	44.42	1.95	15.95
198	24	M06S12E32	4.40	0.00	0.00	0.00	0.00	2.30	0.00	0.00	8.40	0.00	0.00	0.00	100.00	100.00	58.00	16.50	0.75	3.60
199	24	M07S13E35	3.20	0.20	0.00	0.80	0.80	0.70	0.00	0.00	4.40	1.20	0.00	0.00	97.00	94.00	88.50	71.50	1.05	29.80
200	24	M07S13E36	3.20	0.20	0.00	0.33	0.67	0.83	0.33	0.00	4.40	1.17	0.00	0.00	96.25	92.92	85.00	73.75	1.54	29.58
201	24	M08S13E01	2.90	0.50	0.00	0.30	0.80	0.80	0.20	0.00	6.90	1.30	0.00	0.00	96.75	94.25	87.75	76.00	1.43	31.45
202	24	M08S12E25	2.13	1.00	0.50	0.00	1.00	1.25	1.00	0.00	12.50	0.00	0.00	0.00	100.00	99.17	75.83	45.94	1.33	11.65
203	24	M09S12E36	2.13	1.00	0.25	0.00	0.75	1.38	1.00	0.00	13.88	0.67	0.00	0.00	100.00	100.00	83.33	64.17	1.58	25.33
204	27	M14S04E34	3.88	0.25	0.13	0.00	0.25	2.50	0.25	0.00	24.56	0.67	0.00	0.00	96.88	94.38	79.22	57.34	2.06	20.88
205	27	M15S04E17	3.67	0.00	0.00	0.00	0.33	1.17	0.00	0.00	13.17	0.33	0.00	0.00	95.83	92.50	77.50	49.17	2.17	15.67
206	27	M15S04E29	4.08	0.08	0.08	0.00	0.58	3.17	0.00	0.00	16.33	0.58	0.00	0.83	94.58	92.29	80.00	57.40	1.67	21.65
207	27	M18S04E15	4.56	0.11	0.00	0.00	0.33	1.67	0.00	0.00	16.56	0.44	0.00	1.11	93.61	91.39	75.97	52.92	1.72	18.53
208	27	M18S07E28	4.11	0.22	0.22	0.00	0.22	1.67	0.11	0.00	23.28	0.67	0.00	1.77	89.17	86.11	72.08	52.08	1.92	21.58
209	30	S03S09W32	3.88	0.00	0.00	0.00	0.56	6.22	0.00	0.00	6.83	0.33	0.00	1.94	87.78	84.44	70.56	51.39	1.34	16.78
210	30	S03S09W33	3.89	0.00	0.00	0.00	0.56	6.17	0.00	0.11	10.06	0.44	0.00	0.00	96.67	95.00	79.72	59.72	1.81	21.06
OBS	BD1	PERM1	AWC1	CEC1	SALIN1	LAYDEP2	SHRINK2	INCH102	INCH32	N042	N0102	N0402	N02002	OM2	CLAY2	BD2	PERM2	AWC2	CEC2	SALIN2
181	1.43	0.49	0.16	27.50	0.00	38.81	1.88	0.00	0.00	97.81	96.56	92.19	83.13	0.50	43.88	1.41	0.12	0.12	33.44	0.50
182	1.43	0.49	0.17	25.00	0.00	39.81	1.88	0.00	0.00	97.81	96.56	91.56	82.50	0.50	43.88	1.39	0.12	0.12	33.44	0.50
183	1.46	1.11	0.16	20.42	0.00	34.08	1.88	0.00	0.63	92.29	90.21	85.21	74.79	0.33	32.67	1.43	0.33	0.16	22.08	1.83
184	1.50	1.56	0.14	16.67	0.00	35.83	0.92	0.00	1.67	77.29	74.58	68.13	56.67	0.31	27.54	1.50	3.28	0.12	18.83	0.25
185	1.49	1.67	0.14	16.73	0.00	35.25	0.92	0.00	1.73	75.29	72.31	65.19	53.75	0.31	26.87	1.50	3.88	0.15	18.58	0.35
186	1.43	0.75	0.16	24.38	0.13	33.78	1.69	0.00	0.00	97.34	96.41	92.03	83.75	0.48	43.00	1.40	0.32	0.15	29.84	0.38
187	1.43	0.75	0.16	24.69	0.00	34.56	1.63	0.00	0.00	97.34	96.09	91.72	82.81	0.51	42.03	1.40	0.28	0.15	29.84	0.63
188	1.53	2.20	0.13	14.58	0.00	34.58	0.67	0.00	1.04	80.63	77.08	71.94	57.92	0.21	22.75	1.51	4.37	0.13	14.29	0.50
189	1.40	0.58	0.15	32.00	1.20	36.85	1.70	0.00	0.00	100.00	100.00	95.00	89.00	0.49	43.95	1.40	4.46	0.15	32.25	2.60
190	1.50	2.30	0.14	11.25	0.00	33.30	0.90	0.00	1.50	88.25	86.00	81.50	70.25	0.25	28.15	1.47	2.28	0.15	17.53	0.70
191	1.50	2.65	0.14	11.25	0.00	40.25	0.75	0.00	0.00	93.75	92.50	76.25	55.00	0.00	21.13	1.50	1.98	0.15	10.00	1.50
192	1.51	2.20	0.12	9.38	3.00	36.58	0.56	0.00	0.00	94.38	93.13	74.53	51.72	0.00	20.09	1.51	1.79	0.11	10.16	6.13
193	1.51	2.20	0.12	9.38	3.25	37.50	0.69	0.00	0.00	96.25	95.00	77.34	54.22	0.00	22.16	1.49	2.01	0.12	11.72	6.50
194	1.55	4.00	0.10	7.50	0.50	39.75	0.00	0.00	0.00	90.00	86.88	65.00	38.75	0.00	12.50	1.54	2.07	0.10	7.50	1.50
195	1.55	4.00	0.10	7.50	0.50	39.75	0.00	0.00	0.00	90.00	86.88	65.00	38.75	0.00	12.50	1.54	2.07	0.10	7.50	1.50
196	1.55	6.29	0.11	8.73	0.36	37.18	0.09	0.23	7.27	85.23	81.14	60.93	38.18	0.20	13.86	1.57	6.17	0.10	7.48	0.50
197	1.44	2.63	0.12	12.04	0.00	39.58	0.67	0.21	1.33	78.32	72.86	61.06	44.79	0.55	22.18	1.45	3.92	0.10	13.56	0.00
198	1.65	13.00	0.07	3.00	0.00	36.60	0.00	0.00	0.00	100.00	100.00	62.50	28.25	0.25	8.05	1.59	6.70	0.10	4.35	0.00
199	1.44	0.53	0.17	21.04	1.20	34.97	1.40	0.00	0.00	95.75	93.00	83.25	71.50	0.18	36.20	1.49	0.20	0.08	25.50	4.50
200	1.42	0.51	0.17	20.42	3.33	39.58	1.00	0.00	0.00	95.21	91.67	82.29	70.83	0.23	31.71	1.47	0.44	0.12	18.96	3.50
201	1.43	0.50	0.16	23.00	3.00	40.82	1.30	0.00	0.00	96.13	93.38	85.25	73.38	0.23	35.28	1.46	0.33	0.12	24.94	3.90
202	1.53	3.10	0.09	9.79	1.00	36.75	1.06	0.00	0.00	100.00	99.17	85.97	67.92	0.50	30.64	1.49	1.52	0.14	21.84	1.72
203	1.47	1.60	0.11	15.83	2.00	36.92	0.67	0.00	0.00	99.58	98.75	82.50	58.33	0.42	23.92	1.45	0.91	0.14	12.92	2.83
204	1.47	3.97	0.15	20.50	2.07	54.50	0.25	0.00	0.00	98.75	96.88	68.75	39.38	0.75	19.00	1.49	1.01	0.10	18.75	1.00
205	1.50	1.30	0.15	16.67	1.00	48.89	0.00	1.25	0.00	80.28	76.11	62.36	39.86	0.54	19.28	1.53	2.94	0.07	18.75	1.00
206	1.48	4.78	0.14	19.58	1.00	46.63	0.96	0.00	0.00	94.48	91.15	78.54	52.40	0.60	21.18	1.52	0.61	0.06	17.76	1.38
207	1.48	4.08	0.14	17.22	1.00	51.67	0.33	0.00	0.00	99.17	97.08	73.33	37.92	0.92	12.17	1.54	1.00	0.11	13.75	1.00
208	1.46	3.93	0.13	22.22	1.11	53.80	0.20	0.00	3.50	88.50	85.50	59.50	34.50	0.90	17.50	1.51	2.61	0.09	20.00	1.00
209	1.51	3.12	0.13	13.31	1.00	39.36	0.83	0.00	3.61	83.89	81.53	68.68	43.75	0.61	21.39	1.52	2.04	0.10	13.13	1.00
210	1.49	1.57	0.16	17.11	1.00	38.86	1.06	0.00	0.00	95.00	93.44	84.45	58.28	0.49	25.09	1.52	0.80	0.13	13.75	1.00
OBS	CO	MFRS	DRAIN	WATTAB	FLOOD	PAN	HYD	SLOPE	WATSOIL	BEDROCK	LAYDEP1	SHRINK1	INCH101	INCH31	N041	N0101	N0401	N02001	OM1	CLAY1
211	30	S03S09W34	4.00	0.00	0.00	0.00	0.50	3.50	0.00	0.00	7.45	0.30	0	1.75	87.75	84.50	70.50	50.75	1.18	16.80
212	30	S04S09W03	4.13	0.10	0.10	0.00	0.50	4.75	0.10	0.10	8.35	0.20	0	2.50	85.25	80.50	61.25	39.00	1.19	14.20
213	30	S04S09W04	4.00	0.11	0.11	0.00	0.44	4.44	0.11	0.11	11.06	0.38	0	1.88	85.94	80.06	67.81	48.13	1.39	17.13
214	30	S04S09W07	4.50	0.17	0.17	0.00	0.17	1.33	0.14	0.00	5.42	0.00	0	2.50	84.17	82.50	56.67	27.92	0.81	7.50
215	30	S04S09W18	4.40	0.14	0.14	0.00	0.44	1.93	0.14	0.00	6.50	0.00	0	2.14	84.64	82.86	60.00	30.36	0.73	8.50
216	30	S04S10W01	4.33	0.00	0.00	0.00	0.00	1.00	0.00	0.00	9.17	0.00	0	0.00	95.83	94.17	75.00	44.17	1.33</	

234	33	S03S06W23	4.00	0.00	0.00	0.44	0.11	4.11	0.00	0.00	6.89	0.00	0	0.00	97.78	93.06	66.39	46.94	0.72	13.28
235	33	S03S06W31	4.40	0.00	0.00	0.00	0.00	2.60	0.00	0.00	9.20	0.00	0	6.00	75.00	70.00	56.50	40.50	0.95	18.60
236	34	M10N04E27	2.50	0.50	0.00	1.00	1.00	0.88	0.50	0.00	9.40	1.00	0	0.00	98.75	98.75	88.75	71.25	2.13	35.00
237	39	M1S06E12	3.80	0.00	0.00	0.40	0.00	1.00	0.00	0.00	9.40	0.00	0	0.00	97.00	94.50	62.30	31.00	1.25	6.70
238	39	M1S06E13	3.33	0.00	0.00	0.50	0.00	1.00	0.00	0.00	9.50	0.00	0	0.00	97.50	95.00	63.33	29.17	1.67	7.17
239	39	M2S05E13	1.60	0.80	0.00	0.00	0.60	1.00	0.40	0.00	8.50	1.20	0	0.00	100.00	99.50	91.50	79.00	3.10	36.30
240	39	M2S05E14	2.25	0.50	0.00	0.00	1.00	1.00	0.25	0.00	8.13	1.50	0	0.63	99.38	98.75	94.38	84.38	2.63	42.13

OBS	BD1	PERMI	AWC1	CEC1	SALIN1	LAYDEP2	SHRINK2	INCH102	INCH32	N042	N0102	N0402	N02002	OM2	CLAY2	BD2	PERM2	AWC2	CEC2	SALIN2
211	1.52	2.94	0.14	12.94	1.00	38.21	0.78	0	3.25	83.50	80.88	71.44	49.19	0.68	20.71	1.53	2.29	0.12	12.86	1.00
212	1.53	5.36	0.10	12.88	1.00	38.41	0.51	0	6.11	76.39	73.61	58.22	35.63	0.51	16.38	1.55	3.66	0.09	10.17	1.00
213	1.49	4.30	0.12	18.17	1.00	37.17	0.68	0	2.14	85.36	83.21	68.30	42.23	0.44	17.20	1.53	4.36	0.10	12.90	1.00
214	1.56	7.60	0.09	7.00	1.00	38.92	0.14	0	2.50	85.42	82.92	60.35	30.21	0.94	9.76	1.59	5.62	0.10	7.98	1.00
215	1.56	7.29	0.10	8.10	1.00	37.36	0.19	0	2.14	84.64	81.79	63.69	35.36	0.70	10.90	1.59	5.40	0.11	8.13	1.00
216	1.55	2.20	0.14	9.67	1.00	40.00	0.33	0	0.00	93.33	90.83	76.67	44.17	1.00	15.67	1.58	2.20	0.14	8.83	1.00
217	1.58	6.10	0.11	5.17	1.00	38.50	0.11	0	0.00	96.67	95.00	74.44	37.50	1.00	11.28	1.61	2.18	0.12	6.06	1.00
218	1.56	4.72	0.13	8.17	1.00	40.17	0.27	0	0.00	94.67	91.83	77.50	48.83	0.70	15.63	1.58	2.13	0.14	8.63	1.00
219	1.58	6.10	0.11	5.17	1.00	38.50	0.11	0	0.00	96.67	95.00	74.44	37.50	1.00	11.28	1.61	2.18	0.12	6.06	1.00
220	1.58	7.06	0.10	5.75	1.00	37.57	0.07	0	2.50	83.17	79.83	62.00	34.33	0.81	10.43	1.60	4.47	0.10	7.04	1.00
221	1.58	8.05	0.09	5.75	1.67	37.57	0.06	0	2.50	85.42	82.92	58.47	27.50	0.81	8.22	1.59	6.09	0.10	6.42	1.50
222	1.58	7.06	0.10	5.75	1.67	38.40	0.07	0	0.52	96.00	94.00	68.67	32.50	0.81	9.77	1.59	4.71	0.11	6.42	1.50
223	1.51	1.30	0.11	5.93	0.00	37.38	1.03	0	5.00	80.23	77.34	69.82	50.16	0.55	28.16	1.26	0.22	0.08	14.51	0.00
224	1.50	1.30	0.15	15.00	0.00	50.88	1.00	0	5.00	90.00	81.88	75.63	63.13	0.94	35.13	1.44	1.08	0.16	15.00	0.00
225	1.60	4.11	0.11	6.88	0.25	42.31	0.29	0	1.25	90.52	85.47	58.33	36.67	0.03	14.84	1.60	4.08	0.11	7.92	0.35
226	1.60	4.32	0.11	7.50	0.57	39.28	0.29	0	0.00	95.00	90.18	66.96	40.18	0.04	15.75	1.61	2.96	0.12	9.55	0.67
227	1.59	10.43	0.08	4.24	1.86	38.75	0.07	0	2.31	88.10	85.15	58.51	26.61	0.00	10.61	1.57	8.11	0.09	4.24	1.86
228	1.60	3.33	0.10	6.15	0.38	41.53	0.71	0	0.41	93.33	88.01	62.53	33.14	0.12	13.11	1.62	5.92	0.10	6.92	1.22
229	1.58	6.33	0.11	9.38	0.27	28.06	0.50	0	0.00	95.71	92.38	71.43	45.30	0.00	20.65	1.58	1.66	0.11	15.22	1.29
230	1.58	3.51	0.11	8.41	0.43	31.12	0.36	0	0.00	96.25	93.38	67.25	43.38	0.00	18.10	1.57	2.65	0.12	12.25	1.65
231	1.52	2.46	0.14	8.93	1.43	44.70	0.27	0	0.00	96.01	93.21	69.05	48.10	0.04	18.39	1.52	3.52	0.13	10.48	1.55
232	1.55	4.90	0.12	7.95	1.45	41.25	0.22	0	0.91	95.08	92.73	64.73	42.77	0.00	15.93	1.53	5.37	0.12	9.17	1.48
233	1.53	4.09	0.12	8.00	1.40	39.08	0.17	0	1.11	93.98	91.39	62.04	40.74	0.00	15.44	1.53	5.48	0.12	8.52	1.59
234	1.53	3.10	0.13	8.06	0.89	44.23	0.17	0	0.00	94.49	91.39	63.52	40.93	0.03	15.19	1.53	4.83	0.12	8.61	1.02
235	1.52	2.38	0.11	10.50	0.00	43.80	0.10	0	4.75	63.75	59.25	47.25	30.25	0.10	16.60	1.55	4.00	0.10	7.00	0.00
236	1.48	9.72	0.15	30.75	0.50	40.90	1.25	0	0.00	96.88	95.94	81.88	64.69	0.00	29.50	1.54	0.14	0.12	29.44	0.50
237	1.63	0.40	0.09	6.50	1.20	43.90	0.00	0	0.00	96.50	92.25	61.00	29.75	0.00	7.00	1.62	9.40	0.07	6.30	1.20
238	1.63	10.00	0.09	7.50	1.33	49.00	0.00	0	0.00	96.67	91.25	61.67	27.92	0.00	7.17	1.62	10.00	0.05	7.50	1.33
239	1.44	0.99	0.15	27.10	1.80	38.05	1.30	0	0.00	100.00	99.50	92.50	73.75	0.00	34.60	1.47	1.03	0.13	23.95	2.80
240	1.43	0.24	0.15	31.38	2.00	37.31	1.88	0	0.63	99.38	98.75	94.38	85.00	0.00	45.75	1.41	0.14	0.14	32.75	3.25

OBS	CO	MTRS	DRAIN	WATTAB	FLOOD	PAN	HYD	SLOPE	WATSOIL	BEDROCK	LAYDEP1	SHRINK1	INCH101	INCH31	N041	N0101	N0401	N02001	OMI	CLAY1
241	39	M2S05E23	3.33	0.00	0.00	0.00	1.00	1.00	0.00	0.00	9.50	1.67	0	0.83	99.17	98.33	95.00	85.00	1.33	43.67
242	39	M2S05E24	2.67	0.33	0.00	0.00	0.67	1.00	0.00	0.00	8.17	1.67	0	0.00	100.00	99.17	95.00	85.00	1.67	43.67
243	39	M2S06E19	3.00	0.25	0.00	0.00	0.50	1.00	0.00	0.00	8.25	1.50	0	0.63	99.38	98.13	93.75	82.50	1.50	40.50
244	40	M2S13E33	4.33	0.17	0.33	0.00	0.50	3.67	0.00	0.00	8.33	0.50	0	0.42	92.08	85.83	65.42	38.75	2.25	16.67
245	40	S11N35W25	3.60	0.00	0.20	0.00	0.80	1.70	0.00	0.00	9.10	0.20	0	0.50	94.00	89.50	63.50	37.50	1.75	13.00
246	48	M7N01E04	4.40	0.00	0.00	0.00	0.80	1.00	0.00	0.60	11.70	1.20	0	0.00	100.00	99.50	92.00	80.50	1.55	33.10
247	50	M2S12E31	3.80	0.10	0.20	0.10	0.80	2.50	0.20	0.60	4.95	1.30	0	8.75	90.00	85.50	77.75	65.75	1.33	36.85
248	50	M3S09E01	3.40	0.00	0.00	0.40	0.64	1.20	0.09	0.36	7.80	0.00	0	0.00	97.50	94.50	69.50	43.50	0.95	14.00
249	50	M3S12E06	3.91	0.09	0.00	0.00	0.06	2.77	0.00	0.36	5.55	1.09	0	3.41	94.32	90.91	82.73	69.39	1.45	33.68
250	50	M4S09E10	4.33	0.00	0.00	0.00	0.00	1.17	0.00	0.00	5.67	0.00	0	0.83	95.00	89.17	60.00	33.33	0.75	9.17
251	50	M4S09E15	4.33	0.00	0.00	0.00	0.33	1.17	0.00	0.00	5.67	0.00	0	0.83	95.00	89.17	60.00	33.33	0.75	9.17
252	50	M4S09E16	3.83	0.33	0.00	0.00	0.33	0.83	0.00	0.00	5.50	0.00	0	0.42	96.25	91.67	66.25	37.92	0.75	10.33
253	50	M4S09E20	2.50	0.67	0.00	0.00	0.67	0.83	0.14	0.00	6.08	0.00	0	0.42	98.75	95.00	70.42	37.92	0.75	10.17
254	50	M4S09E21	3.43	0.43	0.00	0.00	0.43	1.50	0.00	0.14	6.21	0.00	0	0.36	97.50	93.57	67.14	38.57	0.75	10.71
255	50	M4S09E22	3.13	0.50	0.00	0.00	0.50	1.38	0.25	0.00	5.38	0.00	0	0.31	97.81	94.38	68.13	36.88	0.75	10.71
256	50	M4S09E23	3.33	0.50	0.00	0.00	0.50	0.83	0.17	0.00	5.33	0.00	0	0.42	97.50	93.75	67.50	35.00	0.75	9.08
257	51	M12N04E26	2.86	0.43	0.00	0.00	0.86	1.00	0.57	0.00	10.00	0.71	0	0.00	98.93	97.50	90.00	76.07	1.29	30.29
258	51	M13N04E24	3.50	0.25	0.00	0.25	0.75	1.00	0.25	0.00	8.13	0.00	0	0.00	97.50	93.75	76.25	49.38	0.88	16.38
259	51	M13N05E18	3.50	0.33	0.17	0.00	0.50	1.00	0.50	0.00	7.08	0.00	0	0.00	97.08	93.33	77.08	52.92	0.96	16.08
260	51	M13N05E35	2.75	0.25	0.00	0.00	1.00	0.75	0.25	1.00	7.80	1.25	0	0.00	100.00	100.00	95.63	80.00	1.75	35.13
261	51	M17N02E35	4.07	0.20	0.00	0.00	0.69	0.90	0.20	0.00	8.60	0.89	0	0.00	99.50	99.00	91.47	74.21	1.90	31.77
262	52	M25N03W23	4.07	0.00	0.00	0.00	0.69	2.57	0.00	0.00	5.90	0.00	0	1.33	82.00	78.33	67.47	50.33	1.30	17.33
263	52	M25N03W24	4.21	0.00	0.00	0.00	0.50	2.32	0.07	0.00	5.14	0.00	0	2.32	75.89	72.32	60.89	43.21	1.25	16.04
264	52	M26N03W35	4.00	0.08	0.00	0.08	0.75	2.50	0.00	0.00	7.25</									

248	1.53	2.20	0.12	11.00	0.00	39.98	0.77	0	0.00	97.25	94.08	73.42	48.83	0.22	25.22	1.55	1.29	0.10	14.50	0.00
249	1.46	1.34	0.15	27.50	0.00	33.47	1.09	0	1.82	92.27	88.86	77.16	44.43	0.45	31.43	1.48	1.29	0.12	23.75	0.23
250	1.58	7.00	0.11	6.00	0.00	35.67	0.00	0	0.83	96.25	91.25	65.42	37.50	0.25	11.25	1.58	6.40	0.12	6.83	0.00
251	1.56	7.00	0.11	6.00	0.00	35.67	0.00	0	0.42	96.25	91.25	65.42	37.50	0.25	11.25	1.58	6.40	0.12	6.83	0.00
252	1.56	5.05	0.11	6.75	1.00	35.67	0.00	0	0.42	97.50	93.75	71.67	42.92	0.21	12.79	1.59	4.03	0.12	7.58	1.17
253	1.57	4.60	0.10	6.75	2.00	34.83	0.00	0	0.42	98.75	95.00	70.18	41.07	0.19	11.67	1.59	4.08	0.11	6.75	2.17
254	1.57	4.90	0.11	6.86	0.86	35.50	0.00	0	0.36	98.04	94.46	70.18	41.07	0.21	12.46	1.59	4.28	0.12	7.21	1.00
255	1.57	5.58	0.10	6.38	1.50	34.44	0.00	0	0.31	98.28	95.16	68.91	37.81	0.20	11.47	1.61	4.96	0.11	6.69	1.63
256	1.58	0.84	0.10	6.00	1.00	34.50	0.00	0	0.42	98.13	94.79	68.54	35.83	0.21	10.88	1.61	5.83	0.10	6.42	1.17
257	1.46	1.84	0.16	22.50	1.00	40.86	1.57	0	0.00	98.93	98.21	90.18	76.96	0.29	36.43	1.49	0.41	0.15	24.46	1.14
258	1.49	1.98	0.13	8.75	1.00	38.00	0.88	0	0.00	97.19	95.06	75.94	49.38	0.38	26.00	1.56	1.24	0.09	13.75	1.00
259	1.52	3.70	0.13	9.00	1.00	39.00	0.67	0	0.00	96.25	93.75	73.75	49.58	0.33	20.67	1.54	3.34	0.11	11.83	1.00
260	1.40	0.33	0.18	25.63	1.00	31.73	1.40	0	0.00	96.08	96.08	91.27	77.81	0.41	39.18	1.38	0.23	0.15	27.88	0.96
261	1.28	0.62	0.17	23.00	1.00	33.27	1.40	0	0.00	99.50	99.00	91.00	74.00	0.40	34.85	1.31	0.47	0.16	23.50	1.00
262	1.51	1.48	0.14	12.00	1.00	36.38	0.68	0	1.83	77.33	73.56	64.47	50.53	0.25	25.46	1.48	1.22	0.12	15.32	0.00
263	1.52	2.33	0.13	10.75	0.00	35.45	0.48	0	2.86	72.50	68.72	57.20	42.35	0.24	21.70	1.51	1.94	0.11	12.86	0.00
264	1.49	1.20	0.15	16.46	0.00	34.86	0.28	0	1.04	84.38	81.18	75.35	64.03	0.28	34.01	1.43	0.49	0.13	20.76	0.08
265	1.55	2.84	0.12	9.64	0.00	39.71	0.00	0	0.00	96.25	92.36	68.89	40.00	0.97	16.81	1.54	2.53	0.09	11.17	0.61
266	1.55	2.65	0.13	10.00	0.00	41.31	0.33	0	0.00	95.83	93.13	72.29	42.29	1.23	20.13	1.57	2.09	0.12	12.92	0.25
267	1.55	5.65	0.12	10.00	0.50	35.65	0.44	0	0.42	84.44	80.21	64.86	39.24	0.54	11.71	1.57	6.44	0.10	11.46	0.50
268	1.52	2.20	0.14	11.67	0.67	29.54	0.56	0	0.00	93.06	89.58	68.89	45.14	0.25	16.42	1.52	3.91	0.12	14.58	0.67
269	1.43	1.19	0.14	17.50	2.00	34.79	1.03	0	1.50	85.33	79.25	63.33	47.83	0.53	31.15	1.44	2.45	0.12	19.00	0.00
270	1.43	1.81	0.14	16.67	2.00	36.92	0.83	0	0.00	91.25	86.67	68.58	49.58	0.92	23.42	1.49	3.21	0.12	16.25	2.00

O B S C O M T R S D R A I N A T T A B D F L O A T O A P A N Y D S L O P E W A T S O I L E D R O C K L A Y D E P I S H R I N K I O I I N C H I I N C H I I N O I O I N O I O I N O I O I N O I O I C L A Y I P E R M I A W C I S A L I N I L A Y D E P 2 S H R I N K I O 2 I N C H I 2 I N C H I 2 N O 4 2 N O 4 2 N O 4 2 N O 4 2 C L A Y 2 P E R M 2 A W C 2 S A L I N 2

271	54	MI6S24E05	3.75	0.00	0.50	0.50	1.00	0.00	0.00	5.38	0.00	0.00	96.88	93.75	71.88	47.50	1.13	13.13	1.54	4.90	0.13	10.63	0.75	37.47	0.42	0.00	0.00	93.54	89.69	65.73	41.35	0.69	11.31	1.56	6.35	0.12	11.25	0.75
272	54	MI6S24E06	3.75	0.00	0.50	0.50	1.00	0.00	0.00	5.38	0.00	0.00	96.88	93.75	71.88	47.50	1.13	13.13	1.54	4.90	0.13	10.63	0.75	37.47	0.42	0.00	0.00	93.54	89.69	65.73	41.35	0.69	11.31	1.56	6.35	0.12	11.25	0.75
273	54	MI6S24E09	3.50	0.00	0.50	0.50	1.00	0.00	0.00	3.75	0.00	0.00	97.50	93.75	72.50	48.75	0.63	13.75	1.50	2.65	0.13	14.00	1.00	60.33	53.00	0.00	0.00	90.83	85.63	61.46	41.46	0.25	13.38	1.56	5.75	0.12	11.25	1.00
274	54	MI6S24E10	3.80	0.00	0.60	0.60	2.80	0.00	0.20	5.60	0.20	1.50	92.00	85.50	69.50	45.50	1.46	16.40	1.51	4.00	0.13	11.00	1.00	60.33	53.00	0.00	0.00	88.33	81.25	59.08	41.33	0.78	17.65	1.52	5.14	0.11	13.25	0.60
275	54	MI6S24E11	3.60	0.00	0.60	0.60	2.80	0.00	0.00	5.60	0.00	0.00	92.50	85.50	69.50	47.50	1.05	14.50	1.53	4.18	0.10	12.50	1.00	60.33	53.00	0.00	0.00	82.33	88.25	65.33	42.33	0.78	13.55	1.55	5.13	0.12	12.25	0.60
276	54	MI6S24E12	3.25	0.00	0.75	0.75	1.00	0.00	0.00	5.25	0.00	0.00	96.25	93.13	76.25	55.00	1.13	17.50	1.51	1.98	0.15	12.50	1.00	60.33	53.00	0.00	0.00	92.92	89.06	71.04	48.85	0.69	16.31	1.54	3.16	0.12	14.69	0.75
277	54	MI6S24E13	3.25	0.00	0.75	0.75	1.00	0.00	0.00	5.25	0.00	0.00	96.25	93.13	76.25	55.00	1.13	17.50	1.51	1.98	0.15	12.50	1.00	60.33	53.00	0.00	0.00	92.92	89.06	71.04	48.85	0.69	16.31	1.54	3.16	0.12	14.69	0.75
278	54	MI6S24E14	3.35	0.00	0.67	0.67	1.00	0.00	0.00	5.33	0.00	0.00	95.83	91.67	74.17	55.63	1.25	16.67	1.50	2.20	0.14	11.67	1.00	35.04	0.52	0.00	0.00	91.29	86.25	66.81	47.64	0.83	14.25	1.53	4.14	0.13	12.50	1.00
279	54	MI6S24E15	3.75	0.00	0.50	0.50	1.00	0.00	0.00	5.75	0.00	0.00	96.88	91.25	66.25	45.63	1.13	13.13	1.53	4.90	0.12	11.67	1.00	35.04	0.52	0.00	0.00	92.29	85.94	60.73	40.10	0.69	11.31	1.55	6.35	0.11	10.00	0.75
280	54	MI6S24E16	3.60	0.00	0.60	0.60	1.00	0.00	0.00	5.60	0.00	0.00	97.00	92.50	69.50	47.50	1.05	14.50	1.53	4.90	0.13	10.50	1.00	60.33	53.00	0.00	0.00	93.33	88.25	65.33	42.58	0.69	13.55	1.55	5.13	0.11	12.25	0.60
281	54	MI6S24E22	3.75	0.00	0.50	0.50	1.00	0.00	0.00	5.75	0.00	0.00	96.88	91.25	66.25	45.63	1.13	13.13	1.53	4.90	0.12	9.38	0.75	36.78	0.52	0.00	0.00	92.29	85.94	60.73	40.10	0.69	11.31	1.55	6.35	0.11	10.00	0.75
282	54	MI6S24E25	3.21	0.00	0.79	0.79	1.00	0.00	0.00	4.55	0.21	0.00	97.21	93.68	76.14	51.07	1.17	17.21	1.49	2.78	0.14	10.74	1.00	32.43	0.58	0.00	0.00	92.70	78.47	61.53	39.93	0.29	15.05	1.36	1.87	0.11	12.02	2.41
283	54	MI6S24E26	3.25	0.00	0.75	0.75	1.00	0.00	0.00	4.04	0.00	0.00	98.13	95.00	72.50	46.25	0.63	15.13	1.49	2.45	0.14	11.25	1.00	32.43	0.58	0.00	0.00	91.67	87.19	64.79	40.42	0.28	13.56	1.48	3.84	0.11	13.13	1.59
284	54	MI6S24E27	3.33	0.00	0.67	0.67	1.00	0.00	0.00	3.72	0.16	0.00	98.33	94.17	69.17	43.33	0.68	13.50	1.47	2.22	0.13	10.50	1.00	63.34	21.22	0.00	0.00	89.72	83.75	58.47	36.39	0.29	10.58	1.45	5.05	0.11	11.00	2.13
285	54	MI6S24E33	3.36	0.00	0.80	0.80	1.00	0.00	0.00	4.24	0.00	0.00	98.26	93.94	73.41	49.33	0.63	16.26	1.49	2.22	0.14	10.59	1.00	63.34	21.22	0.00	0.00	85.16	81.02	60.47	38.70	0.29	14.29	1.38	3.06	0.10	11.62	2.13
286	54	MI6S24E34	3.50	0.00	0.50	0.50	1.00	0.00	0.00	3.32	0.00	0.00	98.75	95.00	62.50	37.50	0.63	12.75	1.45	3.64	0.12	10.00	1.00	94.33	70.00	0.00	0.00	90.25	85.63	54.38	30.00	0.31	8.13	1.43	6.06	0.10	9.38	2.68
287	54	MI6S24E35	3.61	0.00	0.67	0.67	1.00	0.00	0.00	3.90	0.27	0.00	97.21	93.24	67.35	45.59	0.64	15.44	1.47	2.80	0.13	9.31	2.49	32.43	0.22	0.00	0.00	82.54	75.87	50.65	30.60	0.31	11.15	1.28	4.26	0.10	8.10	3.22
288	54	MI6S24E36	3.20	0.00	1.00	1.00	3.25	0.00	0.00	4.55	0.00	0.00	97.21	93.68	76.14	51.07	1.17	17.21	1.49	2.78	0.14	10.74	1.00	32.43	0.58	0.00	0.00	92.70	78.47	61.53	39.93	0.29	15.05	1.36	1.87	0.11	12.02	2.41
289	54	MI6S25E04	3.20	0.00	1.00	1.00	3.25	0.00	0.00	4.55	0.00	0.00	97.21	93.68	76.14	51.07	1.17	17.21	1.49	2.78	0.14	10.74	1.00	32.43	0.58	0.00	0.00	92.70	78.47	61.53	39.93	0.29	15.05	1.36	1.87	0.11	12.02	2.41
290	54	MI6S25E05	4.00	0.00	0.25	0.50	1.38	0.00	0.00	9.50	0.50	0.00	95.00	91.25	69.38	44.38	1.44	20.50	1.51	4.61	0.11	15.13	0.00	41.78	0.67	0.00	0.00	96.67	94.38	70.21	43.33	0.28	22.73	1.56	4.33	0.10	17.08	0.50
29																																						

322	54	MI7S26E25	3.60	0.00	0.60	0.80	0.00	0.00	0.00	10.10	0.40	0.50	96.50	92.00	82.50	57.50	1.45	23.60	1.49	1.61	0.14	16.50	0.20	42.40	0.73	0.00	95.00	90.83	78.17	51.50	0.82	25.47	1.49	1.46	0.11	17.40	0.53
323	54	MI7S26E26	3.60	0.00	0.40	0.60	2.80	0.00	0.00	11.30	0.40	0.50	97.00	93.50	78.50	52.50	1.45	22.90	1.50	2.15	0.13	15.50	0.20	44.15	0.67	0.00	96.67	94.50	79.33	51.83	0.98	25.40	1.48	1.70	0.12	16.83	0.60
324	54	MI7S26E27	3.60	0.00	0.33	1.00	2.50	0.00	0.00	12.83	1.33	0.67	94.17	89.17	82.50	68.33	1.83	40.00	1.42	0.52	0.13	29.17	0.00	46.88	1.56	0.00	98.80	97.50	89.44	67.78	0.86	40.83	1.39	0.15	0.12	29.17	0.67
325	54	MI7S26E29	3.00	0.00	1.00	1.00	1.00	0.00	0.00	6.50	1.00	0.00	97.50	92.50	82.50	55.00	1.50	20.00	1.55	1.30	0.15	12.50	0.00	36.63	0.67	0.00	96.67	92.50	78.33	48.33	1.08	27.50	1.46	0.19	0.08	17.50	0.00
326	54	MI7S26E30	3.50	0.00	0.50	1.00	0.00	0.00	0.00	11.25	1.00	0.125	95.00	90.00	82.50	65.00	1.75	35.00	1.45	0.72	0.14	12.50	0.00	44.31	1.33	0.00	98.33	96.25	86.67	62.92	0.92	37.50	1.40	0.16	0.11	26.25	0.50
327	54	MI7S26E31	3.00	0.00	1.00	1.00	0.00	0.00	0.00	4.75	0.00	0.00	97.50	95.00	82.50	55.00	0.63	17.50	1.53	1.30	0.15	12.50	0.50	28.56	0.83	0.00	92.08	88.75	75.21	50.83	0.25	19.00	1.54	1.61	0.12	16.88	0.50
328	54	MI7S26E32	3.00	0.00	1.00	1.00	0.00	0.00	0.00	4.75	0.00	0.00	97.50	95.00	82.50	55.00	0.63	17.50	1.53	1.30	0.15	12.50	0.50	28.56	0.83	0.00	92.08	88.75	75.21	50.83	0.25	19.00	1.54	1.61	0.12	16.88	0.50

OBS	CO	MRS	DRAIN	WATTAB	FLOOD	PAN	HYD	SLOPE	WATSOIL	BEDROCK	LAYDEP1	SHRINK1	INCH101	INCH31	N041	N0101	N0401	N02001	OMI	CLAY1
329	54	MI7S26E33	3.00	0	0	1.00	1.00	1.00	0.00	0.00	4.75	0.00	0	0.00	97.50	95.00	82.50	55.00	0.63	17.50
330	54	MI7S26E34	3.00	0	0	1.00	1.00	1.00	0.00	0.00	4.75	0.00	0	0.00	97.50	95.00	82.50	55.00	0.63	17.50
331	54	MI7S26E35	3.75	0	0	0.50	0.50	1.00	0.00	0.00	5.75	0.00	0	0.00	98.75	95.00	67.50	39.38	0.88	12.25
332	54	MI7S26E36	3.86	0	0	0.23	0.43	1.86	0.14	0.00	8.93	0.00	0	0.00	98.21	95.36	77.14	46.07	1.57	13.71
333	54	MI7S27E29	3.91	0	0	0.27	0.64	4.95	0.00	0.09	8.59	0.73	0	3.86	94.55	90.00	76.36	57.95	1.64	27.91
334	54	MI7S27E31	3.80	0	0	0.60	0.80	3.10	0.00	0.00	8.30	0.80	0	0.50	97.00	93.50	79.50	57.00	1.45	28.50
335	54	MI8S23E36	3.75	0	0	0.00	0.00	1.00	0.00	0.00	6.46	0.00	0	0.00	100.00	100.00	74.38	51.25	1.44	15.25
336	54	MI8S24E31	3.67	0	0	0.00	0.00	1.00	0.00	0.00	6.45	0.00	0	0.00	100.00	100.00	78.33	58.33	1.42	16.50
337	54	MI8S25E01	3.00	0	0	1.00	1.00	1.00	0.00	0.00	4.75	0.00	0	0.00	97.50	95.00	82.50	55.00	0.63	17.50
338	54	MI8S25E12	3.00	0	0	0.33	0.33	0.83	0.00	0.00	6.00	0.00	0	0.00	99.17	96.67	77.50	47.50	1.83	14.00
339	54	MI8S25E13	3.00	0	0	0.30	0.30	0.75	0.00	0.00	6.75	0.00	0	0.00	100.00	98.75	75.00	43.75	2.50	13.50
340	54	MI8S26E01	4.00	0	0	0.20	0.20	2.20	0.20	0.00	9.80	0.00	0	0.00	98.50	96.50	75.00	42.50	1.60	12.20
341	54	MI8S26E02	3.40	0	0	0.40	0.40	1.00	0.00	0.00	6.20	0.00	0	0.00	99.00	95.50	68.50	40.00	1.40	12.40
342	54	MI8S26E04	3.50	0	0	0.50	0.75	3.88	0.00	0.25	3.75	0.75	0	1.88	91.88	88.13	78.13	60.00	1.31	28.63
343	54	MI8S26E06	3.00	0	0	1.00	1.00	1.00	0.00	0.00	4.75	0.00	0	0.00	97.50	95.00	82.00	55.00	0.63	17.50
344	54	MI8S26E09	3.20	0	0	0.40	0.60	3.30	0.00	0.20	4.60	0.60	0	1.50	93.50	90.00	77.00	56.50	1.75	25.50
345	54	MI8S26E14	3.75	0	0	0.00	0.00	1.00	0.00	0.00	6.46	0.00	0	0.00	99.38	95.63	63.75	37.50	1.44	10.25
346	54	MI8S26E16	3.25	0	0	0.25	0.50	3.13	0.00	0.25	5.00	0.25	0	1.88	92.50	88.13	71.25	46.88	2.00	17.88
347	54	MI8S26E21	3.00	0	0	0.40	0.50	0.75	0.00	0.00	6.75	0.00	0	0.00	100.00	98.75	75.00	43.75	2.50	13.50
348	54	MI8S26E22	3.25	0	0	0.25	0.50	3.25	0.00	0.25	5.59	0.25	0	1.88	92.50	88.13	71.25	47.50	1.81	17.63
349	54	MI8S26E23	3.50	0	0	0.33	0.33	1.00	0.00	0.00	5.89	0.00	0	0.42	98.75	95.42	70.00	43.33	1.17	12.67
350	54	MI8S26E24	3.67	0	0	0.50	1.75	1.75	0.00	0.00	6.75	0.00	0	0.00	95.83	91.67	79.58	54.17	1.83	15.75
352	54	MI8S26E25	3.75	0	0	0.00	0.50	1.00	0.00	0.00	9.00	0.00	0	0.00	96.25	93.13	76.88	51.25	1.50	16.00
352	54	MI8S26E26	3.00	0	0	1.00	1.00	1.00	0.00	0.00	4.50	0.00	0	0.00	97.50	92.50	82.50	55.00	0.50	15.00
353	54	MI8S26E27	3.00	0	0	0.33	0.33	1.00	0.00	0.00	6.78	0.00	0	0.00	99.17	96.67	77.50	48.33	1.58	13.67
354	54	MI8S26E28	3.25	0	0	0.25	0.25	0.88	0.00	0.00	6.46	0.00	0	0.00	99.38	97.50	77.50	47.50	1.56	13.75
355	54	MI8S26E33	3.00	0	0	0.50	0.50	0.88	0.00	0.00	6.63	0.00	0	0.00	97.50	94.38	77.50	52.50	2.00	16.13
356	54	MI8S26E34	3.33	0	0	0.67	0.83	0.83	0.00	0.00	6.17	0.00	0	0.00	96.67	93.33	79.17	55.83	1.50	17.17
357	54	MI8S26E35	3.50	0	0	0.50	0.50	0.75	0.00	0.00	5.00	0.00	0	0.00	98.75	96.25	80.00	50.00	1.00	14.50
358	54	MI8S26E36	3.86	0	0	0.29	0.57	3.21	0.00	0.00	10.29	0.57	0	1.07	94.64	90.71	75.71	55.00	1.64	24.57

OBS	BD1	PERM1	AWC1	CEC1	SALIN1	LAYDEP2	SHRINK2	INCH102	INCH32	N042	N0102	N0402	N02002	OM2	CLAY2	BD2	PERM2	AWC2	CEC2	SALIN2
329	1.53	1.30	0.15	12.50	0.50	28.56	0.83	0	0.00	92.08	88.75	75.21	50.83	0.25	19.00	1.54	1.61	0.12	16.88	0.50
330	1.53	1.30	0.15	12.50	0.50	28.56	0.83	0	0.00	92.08	88.75	75.21	50.83	0.25	19.00	1.54	1.61	0.12	16.88	0.50
331	1.55	4.90	0.11	9.38	0.25	40.71	0.42	0.63	94.79	90.63	65.73	39.17	0.25	13.00	1.56	5.06	0.10	11.56	0.50	
332	1.53	3.74	0.13	9.71	0.29	40.71	1.04	0	96.07	92.74	71.19	38.57	0.87	15.26	1.54	4.02	0.10	10.00	0.52	
333	1.46	1.61	0.13	20.23	0.09	43.45	1.00	0	97.73	91.40	75.68	54.58	0.89	28.28	1.47	1.78	0.10	18.16	0.65	
334	1.47	3.17	0.13	20.60	0.20	41.02	1.97	0	97.67	95.50	77.58	51.08	0.73	28.25	1.46	2.75	0.10	19.68	0.40	
335	1.54	3.13	0.13	11.25	1.47	38.92	0.25	0	100.00	99.38	76.35	52.81	0.60	15.38	1.58	2.25	0.15	11.04	1.79	
336	1.54	2.84	0.15	11.67	1.96	39.23	0.33	0	100.00	99.17	78.47	57.92	0.72	16.67	1.58	1.66	0.16	11.39	2.06	
337	1.53	1.30	0.15	12.50	0.50	28.56	0.83	0	92.08	88.75	75.21	50.83	0.25	19.00	1.54	1.61	0.12	16.88	0.50	
338	1.53	1.20	0.13	10.00	0.67	37.51	0.42	0	95.56	92.50	70.00	46.11	0.28	13.39	1.54	3.85	0.12	10.83	1.00	
339	1.55	2.65	0.12	10.00	0.50	38.71	0.20	0	100.00	98.75	71.67	44.58	0.29	12.33	1.56	4.27	0.11	10.00	1.00	
340	1.53	4.72	0.12	8.60	0.40	41.83	0.13	0	96.83	95.00	71.17	37.17	0.92	13.50	1.54	5.04	0.12	8.43	0.60	
341	1.55	4.72	0.12	9.50	0.40	34.28	0.33	0	95.83	92.00	68.08	39.83	0.20	13.00	1.55	4.85	0.10	11.25	0.60	
342	1.45	0.78	0.15	16.88	1.25	30.93	1.17	0	85.73	80.31	68.54	50.73	0.53	31.00	1.46	0.93	0.12	20.63	1.25	
343	1.53	1.30	0.15	12.50	0.50	28.56	0.83	0	92.08	88.75	75.21	50.83	0.25	19.00	1.54	1.61	0.12	16.88	0.50	
344	1.47	1.43	0.14	15.50	1.20	31.59	0.93	0	1.50	88.58	83.75	70.33	49.08	0.43	27.40	1.48	1.54	0.12	18.50	1.20
345	1.56	6.05	0.11	8.13	1.22	36.40	0.00	0	0.63	97.50	82.81	64.69	38.44	0.25	9.94	1.57	6.63	0.11	8.13	1.29
346	1.51	1.75	0.14	11.88	0.50	34.59	0.54	0	1.88	89.79	85.00	65.63	46.15	0.49	20.79	1.51	2.95	0.12	14.38	0.75
347	1.55	2.65	0.12	10.00	0.50	38.71	0.20	0	100.00	98.75	71.67	44.58	0.29	12.33	1.56	4.27	0.11	10.00	1.00	
348	1.53	2.23	0.14	11.88	1.22	33.27	0.54													

60	54	M1S27E08	3.30	0.00	0.40	0.40	2.20	0.00	0.00	8.20	0.00	0.00	98.50	96.00	75.00	44.00	2.75	13.60	1.54	4.18	0.13	9.60	0.20	39.65	0.27	0.00	0.00	98.17	96.00	71.83	37.33	0.98	16.40	1.52	4.27	0.11	10.43	0.40
61	54	M1S27E10	3.33	0.00	0.67	0.67	2.50	0.33	0.00	6.67	0.00	0.00	98.33	94.17	85.83	58.00	2.17	18.00	1.53	1.30	0.15	12.50	0.33	37.42	0.44	0.00	0.00	97.78	94.17	78.06	44.72	1.92	22.67	1.49	4.26	0.12	13.89	0.33
62	54	M1S27E11	3.29	0.00	0.29	0.57	3.00	0.00	0.00	9.79	0.57	0.36	96.79	92.50	75.36	53.21	1.71	24.57	1.50	2.30	0.13	17.86	0.25	43.23	0.77	0.00	0.31	96.55	94.29	76.31	52.74	0.99	27.00	1.48	1.80	0.12	18.45	1.00
63	54	M1S27E12	3.60	0.00	0.33	0.57	4.13	0.00	0.13	10.13	0.67	0.63	96.88	93.13	74.38	51.56	1.69	23.25	1.50	2.30	0.12	16.25	0.25	41.98	0.89	0.00	0.00	96.77	95.00	76.82	52.79	1.07	26.09	1.48	1.88	0.12	15.52	1.00
64	54	M1S27E14	3.57	0.00	0.33	0.57	3.33	0.00	0.00	9.17	0.67	0.63	98.33	93.33	80.83	60.00	1.83	27.00	1.49	1.81	0.14	20.00	0.67	41.98	0.89	0.00	0.31	96.77	95.00	76.82	52.79	1.07	26.09	1.48	1.88	0.12	15.52	1.00
65	54	M1S27E15	3.75	0.00	0.57	0.57	4.50	0.00	0.00	7.00	0.00	0.00	96.25	90.00	71.25	44.38	1.50	13.88	1.55	2.65	0.14	10.00	0.00	40.09	0.25	0.00	0.00	92.71	87.23	64.38	37.92	0.94	16.08	1.56	2.75	0.11	11.80	0.33
66	54	M1S27E16	3.33	0.00	0.67	0.50	3.33	0.00	0.00	9.17	0.67	0.63	97.50	92.50	82.50	55.00	1.50	16.50	1.57	2.20	0.15	12.50	0.83	37.92	0.44	0.00	0.00	95.28	90.83	69.72	43.06	0.97	22.00	1.51	1.46	0.10	13.89	0.33
67	54	M1S27E17	3.00	0.00	1.00	1.00	3.25	0.00	0.00	6.50	0.00	0.00	98.33	94.17	85.83	58.00	2.17	18.00	1.53	1.30	0.15	12.50	0.33	37.42	0.44	0.00	0.00	96.67	92.50	78.33	48.33	1.08	27.50	1.47	0.46	0.10	17.08	0.00
68	54	M1S27E18	3.33	0.00	0.67	0.67	2.40	0.33	0.00	6.67	0.00	0.63	98.33	94.17	85.83	58.00	2.17	18.00	1.53	1.30	0.15	12.50	0.33	37.42	0.44	0.00	0.00	97.78	94.17	78.06	44.72	1.92	22.67	1.49	4.26	0.12	13.89	0.33
69	54	M1S27E19	3.50	0.00	0.40	0.40	2.13	0.00	0.00	8.50	0.00	0.00	96.25	93.13	76.88	50.63	1.35	16.88	1.54	1.98	0.14	10.50	0.00	40.94	0.46	0.00	0.63	95.83	93.13	74.48	43.54	1.04	22.06	1.51	1.64	0.12	13.54	0.50
70	54	M1S27E20	3.60	0.00	0.40	0.50	2.40	0.00	0.00	10.70	0.00	0.00	98.50	96.00	70.40	43.50	1.50	15.20	1.54	2.92	0.13	9.50	0.20	43.35	0.27	0.00	0.00	96.67	94.50	74.33	43.83	1.08	18.20	1.52	2.47	0.11	11.33	0.60
71	54	M1S27E21	3.67	0.00	0.33	0.33	2.58	0.00	0.00	9.50	0.00	0.00	97.08	94.17	80.42	52.92	1.71	16.00	1.53	2.20	0.14	10.83	0.33	42.96	0.35	0.00	0.00	94.62	91.77	74.55	44.24	1.08	19.00	1.51	2.65	0.12	11.65	0.63
72	54	M1S27E23	3.67	0.00	0.38	0.38	2.13	0.00	0.00	11.44	0.75	0.63	96.88	93.44	81.88	60.31	1.66	28.69	1.47	1.54	0.13	20.94	0.38	44.63	0.36	0.00	0.00	96.88	94.27	81.67	57.81	0.82	29.54	1.46	1.46	0.10	20.56	1.08
73	54	M1S27E30	3.50	0.00	0.75	0.75	2.13	0.00	0.00	98.13	0.00	0.00	98.13	94.38	77.50	48.75	1.50	16.63	1.57	1.98	0.14	11.25	0.30	44.13	0.42	0.00	0.00	96.25	91.67	72.71	42.50	0.96	19.58	1.53	3.40	0.10	13.00	0.42
74	54	M1S27E31	3.60	0.00	0.40	0.80	5.00	0.00	0.00	11.60	0.80	1.00	96.00	92.00	78.50	58.00	1.70	30.30	1.47	1.37	0.13	21.50	0.00	45.05	0.00	0.00	0.00	98.67	97.00	83.33	57.83	0.98	32.36	1.44	0.93	0.12	22.33	0.60
75	54	M1S2E531	4.00	0.00	0.40	0.00	0.75	0.00	0.00	4.25	0.00	0.00	98.75	97.50	70.00	43.75	1.13	13.25	1.53	2.65	0.12	10.00	0.50	37.33	0.00	0.00	0.00	97.50	95.63	61.04	40.21	0.42	11.46	1.54	6.52	0.10	11.00	0.00
76	54	M1S2E532	3.88	0.00	0.25	0.67	2.94	0.00	0.00	9.69	0.50	0.94	93.75	98.75	76.25	56.88	1.63	23.63	1.49	1.68	0.14	17.19	0.67	44.61	0.78	0.00	0.31	93.15	89.66	73.56	49.11	0.92	25.32	1.56	2.15	0.12	17.64	0.68
77	54	M1S2E533	3.33	0.00	0.67	0.83	0.00	0.00	0.00	6.17	0.00	0.00	96.67	93.33	77.50	56.25	2.00	17.17	1.52	1.30	0.14	11.00	0.67	38.93	0.56	0.00	0.00	93.06	89.17	70.00	51.94	0.94	14.39	1.56	2.72	0.13	12.50	1.00
78	54	M1S2E534	3.50	0.00	0.50	0.50	0.00	0.00	0.00	7.50	0.00	0.00	96.25	93.75	77.50	56.25	2.00	18.25	1.53	1.30	0.14	12.50	0.50	40.83	0.50	0.00	0.00	96.25	93.75	71.67	53.33	1.29	13.83	1.58	2.82	0.13	12.50	1.00
79	54	M1S2E535	3.00	0.00	1.00	1.00	0.00	0.00	0.00	6.50	0.00	0.00	95.00	90.00	80.00	61.25	1.50	18.75	1.50	1.30	0.15	12.50	1.00	36.81	0.83	0.00	0.00	89.58	83.75	72.08	54.58	1.13	15.75	1.55	1.96	0.14	13.75	1.00
80	54	M1S2E536	3.00	0.00	1.00	1.00	0.00	0.00	0.00	6.50	0.00	1.25	95.00	90.00	80.00	61.25	1.50	18.75	1.50	1.30	0.15	12.50	1.00	36.81	0.83	0.00	0.00	89.58	83.75	72.08	54.58	1.13	15.75	1.55	1.96	0.14	13.75	1.00
81	54	M1S2E537	3.75	0.00	0.50	1.00	4.88	0.00	0.00	11.38	1.00	1.25	95.00	90.00	80.00	65.00	1.75	33.75	1.44	0.72	0.14	25.00	1.00	44.97	1.25	0.00	0.00	97.08	83.13	59.79	75.75	33.58	1.45	0.81	0.11	24.46	0.67	
82	54	M1S2E538	3.00	0.00	1.00	1.00	0.00	0.00	0.00	4.50	0.00	0.00	97.50	92.50	82.00	65.00	0.50	15.00	1.50	1.30	0.15	10.00	1.00	35.13	0.67	0.00	0.00	86.67	80.00	66.67	49.17	0.75	15.56	1.51	3.00	0.14	12.50	1.00
83	54	M1S2E539	3.00	0.00	1.00	1.00	0.00	0.00	0.00	6.50	0.00	0.00	95.00	90.00	80.00	61.25	1.50	18.75	1.50	1.30	0.15	12.50	1.00	36.81	0.83	0.00	0.00	89.58	83.75	72.08	54.58	1.13	15.75	1.55	1.96	0.14	13.75	1.00
84	54	M1S2E540	3.00	0.00	1.00	1.00	0.00	0.00	0.00	4.50	0.00	0.00	97.50	92.50	82.50	65.00	0.50	15.00	1.50	1.30	0.15	10.00	1.00	35.13	0.67	0.00	0.00	86.67	80.00	66.67	49.17	0.75	15.56	1.51	3.00	0.14	12.50	1.00
85	54	M1S2E541	3.50	0.00	1.00	1.00	2.13	0.00	0.00	5.88	0.25	0.00	98.13	93.75	85.83	59.38	1.50	19.63	1.50	1.08	0.15	15.63	0.50	38.28	0.67	0.00	0.00	95.00	88.54	73.33	46.67	0.53	21.21	1.55	1.96	0.08	15.38	2.00
86	54	M1S2E542	3.67	0.00	1.00	2.50	0.00	0.00	0.00	5.67	0.33	0.00	98.33	93.75	86.67	60.83	1.50	19.50	1.48	1.00	0.16	16.67	0.67	38.83	0.67	0.00	0.00	94.44	87.72	71.67	46.11	0.34	19.17	1.58	1.96	0.07	14.67	2.79
87	54	M1S2E543	3.00	0.00	1.00	0.59	1.00	0.00	0.00	3.96	0.91	0.00	95.66	90.88	84.63	67.87	0.63	28.54	1.48	0.74	0.15	20.74	2.85	34.82	0.94	0.00	0.00	81.78	70.74	61.04	49.58	0.88	31.87	1.39	1.58	0.11	16.31	2.79
88	54	M1S2E544	3.00	0.00	0.73	1.00	0.00	0.00	0.00	5.47	0.61	0.00	94.61	89.75	82.25	67.75	1.25	26.53	1.48	0.93	0.15	18.82	2.24	36.05	0.96	0.00	0.00	81.35	76.32	66.96	53.06	0.88	19.91	1.39	1.58	0.11	15.87	2.20
89	54	M1S2E545	3.00	0.00	0.50	0.59	1.00	0.00	0.00	3.96	0.91	0.00	95.66	90.88	84.63	67.87	0.63	28.54	1.48	0.93	0.15	20.74	2.85	34.82	0.94	0.00	0.00	81.35	76.32	66.96	53.06	0.88	19.91	1.39	1.58	0.11	15.87	2.20
90	54	M1S2E546	3.67	0.00	0.50	1.00	0.00	0.00	0.00	6.25	0.00	0.00	95.00	90.00	80.00	67.87	1.50	12.25	1.55	2.65	0.13	10.00	0.00	39.88	0.17	0.00	0.00	92.08	84.58	68.33	34.17	0.83	11.42	1.62	3.40	0.09	8.92	0.83
91	54	M1S2E547	3.67	0.00	0.50	1.00	3.00	0.00	0.00	8.67	1.17	0.78	91.67	85.00	78.33	71.67	2.00	30.00	1.32	0.57	0.13	10.00	0.00	42.65	1.39	0.00	0.83	97.64	94.38	84.86	64.33	0.76	36.33	1.42	0.61	0.09	26.03	1.56
92	54	M1S2E548	3.00	0.00	1.00	1.00	0.00	0.00	0.00	9.70	1.00	1.00	96.00	91.50	85.00	66.25	1.75	35.58	1.44	1.17	0.14	27.08	0.33	42.65	1.39	0.00	1.67	99.17	98.33	93.33	78.33	0.75	48.33	1.32	0.13	0.13	35.23	0.67
93	54	M1S2E549	3.60	0.00	0.60	1.00	1.90	0.00	0.00	9.70	1.00	1.00	94.00	89.50	85.00	66.50	1.70	32.70	1.44	0.65	0.14	2																

440	54	M2S27E06	3.33	0.00	0.00	0.67	0.67	0.83	0.00	0.00	0.00	6.17	0.00	0	0.00	96.67	93.33	79.17	55.83	1.50	17.17
441	54	M2S27E07	4.00	0.00	0.00	0.50	0.50	1.00	0.00	0.00	0.00	5.75	0.00	0	0.00	98.75	91.25	62.50	36.25	0.63	8.75
442	54	M2S27E18	4.00	0.00	0.00	0.33	0.33	0.83	0.00	0.00	0.00	5.67	0.00	0	0.00	99.17	94.17	67.50	39.17	0.52	10.50
443	54	M2S27E34	3.71	0.00	0.00	0.43	0.71	3.64	0.00	0.29	0.29	7.36	0.57	0	0.36	96.43	93.21	82.14	61.43	1.50	25.79
444	54	M23S26E03	3.40	0.00	0.00	0.40	0.40	0.90	0.00	0.00	0.00	5.00	0.40	0	0.00	98.00	96.00	82.50	64.50	1.60	24.80
445	54	M23S27E03	3.83	0.00	0.00	0.33	0.50	4.50	0.00	0.17	0.17	7.50	0.33	0	0.42	95.83	91.25	76.67	54.17	1.50	20.25
446	54	M24S25E36	4.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	3.75	0.00	0	0.00	93.75	91.25	58.75	37.50	1.50	12.75

OBS	BD1	PERM1	AWC1	CEC1	SALIN1	LAYDEP2	SHRINK2	INCH102	INCH32	N042	N0102	N0402	N02002	OM2	CLAY2	BD2	PERM2	AWC2	CEC2	SALIN2
417	1.54	1.98	0.14	11.25	0.00	39.13	0.42	0.00	0.00	93.75	88.54	70.83	41.88	1.02	20.21	1.53	1.79	0.11	13.63	0.17
418	1.53	1.30	0.15	12.50	0.50	28.56	0.83	0.00	0.00	92.08	88.75	75.21	50.83	0.25	19.00	1.54	1.61	0.12	16.88	0.50
419	1.46	1.01	0.15	16.25	1.50	34.09	1.04	0.00	0.00	90.73	86.56	74.79	54.17	0.75	24.25	1.51	1.09	0.13	18.13	1.50
420	1.45	0.91	0.15	16.67	1.67	32.63	1.06	0.00	0.00	90.14	86.25	73.89	52.22	0.32	27.00	1.49	1.15	0.12	19.17	1.67
421	1.46	0.83	0.14	22.50	0.00	43.30	1.13	0.00	0.00	97.00	93.33	82.17	57.50	0.82	32.37	1.45	0.69	0.11	22.90	0.53
422	1.43	0.91	0.15	16.67	2.00	38.13	1.06	0.00	0.00	88.47	82.92	71.81	54.72	0.92	24.83	1.49	1.38	0.13	17.08	2.00
423	1.53	8.50	0.10	5.25	0.50	42.75	0.00	0.00	0.00	93.75	92.50	65.29	59.44	0.38	7.75	1.58	8.50	0.10	5.25	0.50
424	1.48	1.68	0.14	18.13	0.75	38.25	0.83	0.00	0.00	97.39	92.92	77.22	53.96	0.98	24.94	1.50	1.83	0.11	13.21	1.42
425	1.48	1.81	0.13	20.00	0.67	38.00	1.11	0.00	0.00	96.39	91.39	77.22	59.44	0.81	28.94	1.49	1.11	0.10	15.21	1.56
426	1.54	6.10	0.08	5.75	0.00	35.42	0.17	0.00	0.00	94.58	89.58	59.58	25.42	0.21	7.17	1.42	7.90	0.04	6.67	0.33
427	1.55	4.72	0.12	8.60	0.00	36.83	0.40	0.00	0.00	95.17	90.33	64.00	36.83	0.75	15.57	1.56	4.08	0.09	7.50	0.33
428	1.54	2.92	0.11	8.33	0.17	37.83	0.40	0.00	0.00	96.33	92.83	71.83	44.00	1.23	19.57	1.51	2.77	0.10	16.83	0.20
429	1.51	3.95	0.10	13.83	0.33	35.33	1.13	0.00	0.00	97.33	93.50	76.17	55.67	0.77	29.00	1.47	2.74	0.10	16.93	0.80
430	1.45	2.86	0.11	19.75	0.13	41.75	1.30	0.00	0.00	96.34	93.90	79.14	57.56	0.64	32.12	1.45	2.77	0.10	23.04	0.54
431	1.52	1.30	0.14	11.67	0.67	38.00	0.56	0.00	0.00	93.06	89.17	70.00	51.94	0.94	14.39	1.56	2.82	0.13	12.50	1.00
432	1.53	1.98	0.13	11.25	0.50	38.70	0.42	0.00	0.00	94.79	91.88	70.00	48.33	0.77	13.67	1.55	3.11	0.13	11.88	1.00
433	1.53	4.23	0.12	10.33	0.75	40.88	0.50	0.00	0.63	96.88	93.13	65.63	47.29	1.00	13.29	1.56	4.94	0.12	10.42	1.00
434	1.54	4.23	0.12	9.38	0.50	39.70	0.42	0.00	0.63	93.54	88.13	63.13	43.33	0.77	11.42	1.57	5.36	0.11	10.00	0.75
435	1.54	4.23	0.12	9.38	0.50	39.70	0.42	0.00	0.63	93.54	88.13	63.13	43.33	0.77	11.42	1.57	5.36	0.11	10.00	0.75
436	1.54	4.23	0.12	9.38	0.50	39.70	0.42	0.00	0.63	93.54	88.13	63.13	43.33	0.77	11.42	1.57	5.36	0.11	10.00	0.75
437	1.50	1.30	0.15	12.50	1.00	36.81	0.83	0.00	0.00	89.58	83.75	72.08	54.58	1.13	15.75	1.55	1.96	0.14	13.75	1.00
438	1.51	1.84	0.14	10.59	1.81	38.54	0.52	0.00	0.00	89.16	87.27	64.47	46.03	0.51	15.77	1.42	2.77	0.12	10.45	1.86
439	1.51	3.58	0.13	13.29	0.29	38.82	0.52	0.00	0.00	95.10	91.31	70.48	42.14	0.76	20.12	1.52	3.47	0.10	13.93	0.50
440	1.52	1.30	0.14	11.67	0.67	38.93	0.56	0.00	0.00	89.17	85.00	70.00	51.94	0.94	14.39	1.56	2.82	0.13	12.50	1.00
441	1.55	7.15	0.10	6.25	0.50	38.56	0.33	0.00	1.25	90.83	82.50	54.58	33.33	0.25	9.00	1.55	8.00	0.10	7.50	0.50
442	1.55	5.20	0.11	7.50	0.33	40.10	0.22	0.00	0.83	93.89	88.33	58.33	37.78	0.36	9.89	1.56	6.85	0.10	8.33	0.67
443	1.49	1.35	0.14	18.47	0.29	37.43	0.88	0.00	0.36	95.36	91.67	74.94	48.57	0.80	27.80	1.49	1.38	0.10	19.21	0.67
444	1.46	1.07	0.14	15.00	1.60	39.48	0.83	0.00	0.00	93.08	89.75	71.58	55.17	0.90	21.83	1.51	2.00	0.14	15.08	1.80
445	1.51	2.01	0.14	14.58	0.17	39.35	0.58	0.00	0.42	93.47	89.44	69.79	43.19	0.88	22.26	1.52	2.22	0.11	15.33	0.61
446	1.53	4.00	0.11	10.00	0.50	33.00	0.00	0.00	0.00	92.50	89.38	53.13	33.13	0.25	12.13	1.53	6.25	0.09	10.00	1.00

OBS	CO	MTRS	DRAIN	WATTAB	FLOOD	PAN	HYD	SLOPE	WATSOIL	BEDROCK	LAYDEP1	SHRINK1	INCH101	INCH31	N041	N0101	N0401	N02001	OM1	CLAY1
447	54	M24S26E30	3.67	0.00	0.00	0.00	0.00	1.00	0.00	0.00	4.17	0.00	0.00	0.00	99.17	98.33	68.33	47.50	1.42	15.50
448	54	M24S27E01	4.00	0.00	0.00	0.33	1.00	7.67	0.00	0.67	8.33	1.33	0	0.00	99.17	97.50	90.83	75.00	1.50	38.33
449	54	M24S27E35	4.00	0.00	0.00	0.33	1.00	7.67	0.00	0.67	8.33	1.33	0	0.00	99.17	97.50	90.83	75.00	1.50	38.33
450	56	S02N20W24	3.88	0.08	0.00	0.00	0.31	5.56	0.08	0.00	9.53	0.13	0	0.00	95.78	91.88	80.78	57.97	2.09	19.97
451	56	S02N20W24	3.83	0.08	0.00	0.00	0.25	3.75	0.08	0.17	8.71	0.33	0	1.25	93.54	89.17	76.88	54.38	2.15	21.50
452	57	M08N01E01	3.50	0.00	0.00	0.00	0.50	0.63	0.00	0.00	7.88	1.25	0	0.00	100.00	98.75	96.88	88.13	1.81	31.63
453	57	M08N01E02	3.33	0.00	0.00	0.00	1.00	0.50	0.00	0.00	11.17	1.33	0	0.63	100.00	99.17	97.50	87.50	1.52	37.33
454	57	M08N01E11	4.00	0.00	0.00	0.00	0.75	2.50	0.00	0.11	11.88	1.06	0	0.63	95.63	91.25	89.38	76.25	1.50	32.38
455	57	M08N01E14	4.44	0.00	0.22	0.00	0.67	2.50	0.22	0.14	8.61	0.88	0	0.63	96.56	93.44	85.00	70.63	1.29	27.44
456	57	M09N01E17	4.86	0.29	0.00	0.00	1.00	2.79	0.14	0.14	10.36	1.29	0	0.36	97.50	95.00	91.07	78.57	1.68	37.64
457	57	M12N01E24	1.78	1.00	0.11	0.00	1.00	0.67	0.89	0.00	9.39	0.63	0	0.00	100.00	98.89	91.94	74.72	1.94	27.35
458	57	M12N02E30	1.88	0.88	0.13	0.00	0.88	0.69	0.88	0.00	9.44	0.59	0	0.00	100.00	98.75	91.25	72.81	1.88	26.94
459	58	M14N04E27	3.33	0.00	0.33	0.67	0.67	0.50	0.00	0.00	5.00	0.67	0	0.28	98.33	97.50	85.83	68.33	1.58	27.00
460	58	M15N03E12	3.67	0.11	0.56	0.22	0.56	0.56	0.00	0.00	6.17	0.11	0	0.83	96.11	93.89	80.56	57.78	1.67	22.28
461	58	M15N03E13	3.00	0.33	0.67	0.17	0.33	0.50	0.33	0.00	4.50	0.00	0	0.63	97.08	93.33	75.42	43.75	1.21	15.17
462	58	M16N04E07	3.88	0.13	0.88	0.25	0.38	0.50	0.13	0.00	5.00	0.00	0	0.63	95.63	92.50	75.31	47.19	1.44	16.69
463	58	M16N04E24	2.67	0.33	0.33	0.67	0.67	2.17	0.00	0.00	5.17	0.00	0	2.50	90.00	85.83	76.67	51.67	0.92	20.00
464	58	M16N04E26	3.43	0.00	0.00	0.43	0.57	1.36	0.29	0.00	5.14	0.00	0	2.14	90.00	85.71	70.00	45.36	1.25	16.14
465	58	M16N04E29	3.33	0.17	0.50	0.33	0.67	0.50	0.00	0.00	6.50	0.33	0	0.00	97.08	95.42	82.50	62.50	1.29	23.33

OBS	BD1	PERM1	AWC1	CEC1	SALIN1	LAYDEP2	SHRINK2	INCH102	INCH32	N042	N0102	N0402	N02002	OM2	CLAY2	BD2	PERM2	AWC2	CEC2	SALIN2
447	1.50	3.10	0.13	11.67	1.00	36.44	0.33	0.00	0.00	98.33	97.08	67.64	45.42	0.56	15.25	1.51	4.60	0.13	11.39	1.33
448	1.40	0.52	0.14	29.17	0.67	35.25	1.44	0.00	0.00	97.22	93.89	81.39	56.94	0.39	35.61	1.44	1.02	0.07	26.78	0.89
449	1.40	0.52	0.14	29.17	0.67	35.														

6. SAS programs for Canonical Discriminant Analysis

6a. Canonical Discriminant Analysis of cluster results.

```
/*can19.sas 4-22-99*/
/*Finalized COMP and LAYER tables were obtained from NRCS*/
/*in October 1997. Some of the data had been changed which*/
/*resulted in slight changes for averaged section soil data*/
/*Owing to the differences it was concluded that the vulnerability*/
/*analyses would have to be done again starting with the clustering*/
/*of soil data. Positive sections were determined as of 1-13-1999 and*/
/*for this analysis only DPR data for sections designated as PORN='N'*/
/*(Nonpoint source) and STATUS='P' was used. One section from a Ciba*/
/*was used. This program takes data which was spooled from Oracle tables*/
/*and averages variables where low and high values were determined*/
/*or assigns a numeric value to variables with descriptors such as*/
/*low, medium, and high. These data will be censored using*/
/*the slopeh <= 15% cutoff as determined from previous analyses*/

options ls=80 ps=64;
title1 'Cluster analysis of data from the Well Inventory as of:';
title2 'January 14, 1999 and NRCS tables as of April 22 1999';
title3 '1996 SOIL DATA CENSORED BY SLOPEH <= 15% AND WEIGHTED BY DEPTH';
title4 'Rainfall not used to remove sections';
title5 'Muids weighted by composition percentage';

data p;infile 'd:\epa\soiltest\cluster99\apr99\avg19out.dat' lrecl=141;
input cluster 1-2 mtrs $ 4-13 co 15-17 shrink1 19-22 .2 pan 24-27 .2
  perm1 29-33 .2 wattab 35-38 .2 no2001 40-45 .2 no401 47-52 .2 no101 54-59 .2
  no41 61-66 .2 clay1 68-73 .2 awc1 75-78 .2 inch31 80-85 .2 om1 87-90 .2
  no2002 92-97 .2 no402 99-104 .2 no101 106-111 .2 no41 113-118 .2 clay2 120-125 .2
  awc2 127-130 .2 inch32 131-136 .2 om2 138-141 .2;

data p1;set p;if cluster ne 17;
data p2;set p1;if cluster ne 19;
data p3;set p2;if cluster ne 16;
data p4;set p3;if cluster ne 9;
data p5;set p4;if cluster ne 15;
data p6;set p5;if cluster ne 18;
data p7;set p6;if cluster ne 6;

title6 'Candisc on 12 of 19 clusters: shrink1 wattab perm1 pan- AVERAGE METHOD';

proc candisc out=canshw;
var shrink1 wattab pan perm1;
class cluster;

proc plot;
plot can2*can1=cluster/haxis=-15 to 15 by 5 vaxis=-10 to 10 by 5;
plot can3*can1=cluster/haxis=-15 to 15 by 5 vaxis=-10 to 10 by 5;
run;
```

6b. SAS program to derive CV coordinates for the centroids (means) of each cluster.

```
/*canmean19.sas 4-22-99*/
/*Finalized COMP and LAYER tables were obtained from NRCS*/
/*in October 1997. Some of the data had been changed which*/
/*resulted in slight changes for averaged section soil data*/
/*Owing to the differences it was concluded that the vulnerability*/
/*analyses would have to be done again starting with the clustering*/
/*of soil data. Positive sections were determined as of 1-13-1999 and*/
/*for this analysis only DPR data for sections designated as PORN='N'*/
/*(Nonpoint source) and STATUS='P' was used. One section from a Ciba*/
/*was used. This program takes data which was spooled from Oracle tables*/
/*and averages variables where low and high values were determined*/
/*or assigns a numeric value to variables with descriptors such as*/
/*low, medium, and high. These data will be censored using*/
/*the slopeh <= 15% cutoff as determined from previous analyses*/

options ls=80 ps=64;
title1 'Cluster analysis of data from the Well Inventory as of:';
title2 'January 14, 1999' and NRCS tables as of April 22 1999;
title3 '1996 SOIL DATA CENSORED BY SLOPEH <= 15% AND WEIGHTED BY DEPTH';
title4 'Ra infall not used to remove sections';
title5 'Muids weighted by composition percentage';

data p;infile 'd:\epa\soiltest\cluster99\apr99\avg19out.dat' lrecl=141;
input cluster 1-2 mtrs $ 4-13 co 15-17 shrink1 19-22 .2 pan 24-27 .2
  perm1 29-33 .2 wattab 35-38 .2 no2001 40-45 .2 no401 47-52 .2 no101 54-59 .2
  no41 61-66 .2 clay1 68-73 .2 awc1 75-78 .2 inch31 80-85 .2 om1 87-90 .2
  no2002 92-97 .2 no402 99-104 .2 no101 106-111 .2 no41 113-118 .2 clay2 120-125 .2
  awc2 127-130 .2 inch32 131-136 .2 om2 138-141 .2;

data p1;set p;if cluster ne 17;
data p2;set p1;if cluster ne 19;
data p3;set p2;if cluster ne 16;
data p4;set p3;if cluster ne 9;
data p5;set p4;if cluster ne 15;
data p6;set p5;if cluster ne 18;
data p7;set p6;if cluster ne 6;

title6 'Candisc on 12 of 19 clusters: shrink1 wattab perm1 pan- AVERAGE METHOD';
title7 'Means for raw data for 12 clusters and 4 variables';

proc sort;by cluster;
proc means mean noprint; by cluster;
var shrink1 wattab pan perm1;
output out=new mean=mshsw1 mwattab mpan mperm1;

data t2;set new;
cv1=0.9973*mshsw1 + 9.8327*mwattab - 4.7201*mpan - 0.0076*mperm1;
cv2=1.1001*mshsw1 + 4.2927*mwattab + 6.1866*mpan - 0.5364*mperm1;
cv3=-3.6400*mshsw1 + 7.9581*mwattab + 3.0601*mpan + 0.1638*mperm1;

proc print;
run;
```

6c. SAS program to determine the Euclidean distance between each KC section and the centroids of clusters with a test of circular (2CVs) population tolerance intervals.

```
/*cantest19.sas 4-22-99*/
/*Finalized COMP and LAYER tables were obtained from NRCS*/
/*in October 1997. Some of the data had been changed which*/
/*resulted in slight changes for averaged section soil data*/
/*Owing to the differences it was concluded that the vulnerability*/
/*analyses would have to be done again starting with the clustering*/
/*of soil data. Positive sections were determined as of 1-13-1999 and*/
/*for this analysis only DPR data for sections designated as PORN='N'*/
/*(Nonpoint source) and STATUS='P' was used. One section from a Ciba*/
/*was used. This program takes data which was spooled from Oracle tables*/
/*and averages variables where low and high values were determined*/
/*or assigns a numeric value to variables with descriptors such as*/
/*low, medium, and high. These data will be censored using*/
/*the slopeh <= 15% cutoff as determined from previous analyses*/

options ls=140 ps=45;
title1 'Cluster analysis of data from the Well Inventory as of:';
title2 'January 14, 1999 and NRCS tables as of April 22 1999';
title3 '1996 SOIL DATA CENSORED BY SLOPEH <= 15% AND WEIGHTED BY DEPTH';
title4 'Rainfall not used to remove sections';
title5 'Muids weighted by composition percentage';

data p;infile 'd:\epa\soiltest\cluster99\apr99\avg19out.dat' lrecl=141;
input cluster 1-2 mtrs $ 4-13 co 15-17 shrink1 19-22 .2 pan 24-27 .2
  perm1 29-33 .2 wattab 35-38 .2 no2001 40-45 .2 no401 47-52 .2 no101 54-59 .2
  no41 61-66 .2 clay1 68-73 .2 awc1 75-78 .2 inch31 80-85 .2 om1 87-90 .2
  no2002 92-97 .2 no402 99-104 .2 no101 106-111 .2 no41 113-118 .2 clay2 120-125 .2
  awc2 127-130 .2 inch32 131-136 .2 om2 138-141 .2;

data p1;set p;if cluster ne 17;
data p2;set p1;if cluster ne 19;
data p3;set p2;if cluster ne 16;
data p4;set p3;if cluster ne 9;
data p5;set p4;if cluster ne 15;
data p6;set p5;if cluster ne 18;
data p7;set p6;if cluster ne 6;
data p8;set p7;drop no401 no101 no41 clay1 awc1 inch31 om1 no2002 no402 no101
no41 clay2 awc2 inch32 om2;
title6 'Candisc on 12 of 19 clusters: shrink1 wattab perm1 pan- AVERAGE METHOD';
title7 'Means for raw data for 12 clusters and 4 variables';
title8 'Test of 2 Canonical variates at 12 clusters';

data t2;set p8;
cv1=0.9973*shrink1 + 9.8327*wattab - 4.7201*pan - 0.0076*perm1;
cv2=1.1001*shrink1 + 4.2927*wattab + 6.1866*pan - 0.5364*perm1;
cv3=-3.6400*shrink1 + 7.9581*wattab + 3.0601*pan + 0.1638*perm1;

data t3;set t2;
dist1=sqrt(((cv1-.4063)**2)+((cv2-(-3.5231))**2));
dist2=sqrt(((cv1-6.1726)**2)+((cv2-3.5949)**2));
dist3=sqrt(((cv1-0.3509)**2)+((cv2-(-0.8134))**2));
dist4=sqrt(((cv1-(-1.588))**2)+((cv2-1.3412)**2));
dist5=sqrt(((cv1-(-3.959))**2)+((cv2-4.3127)**2));
dist7=sqrt(((cv1-(-1.0159))**2)+((cv2-3.563)**2));
```

```

dist8=sqrt(((cv1-(-2.7919))**2)+((cv2-5.1021)**2));
dist10=sqrt(((cv1-2.7102)**2)+((cv2-1.8638)**2));
dist11=sqrt(((cv1-9.3810)**2)+((cv2-3.9841)**2));
dist12=sqrt(((cv1-4.0805)**2)+((cv2-(-0.5121))**2));
dist13=sqrt(((cv1-9.9362)**2)+((cv2-5.065)**2));
dist14=sqrt(((cv1-7.6056)**2)+((cv2-7.6451)**2));

data t4;set t3;if dist1 ne .;
mem1=0;if dist1<=2.447 then mem1=1;
mem2=0;if dist2<=2.447 then mem2=1;
mem3=0;if dist3<=2.447 then mem3=1;
mem4=0;if dist4<=2.447 then mem4=1;
mem5=0;if dist5<=2.447 then mem5=1;
mem7=0;if dist7<=2.447 then mem7=1;
mem8=0;if dist8<=2.447 then mem8=1;
mem10=0;if dist10<=2.447 then mem10=1;
mem11=0;if dist11<=2.447 then mem11=1;
mem12=0;if dist12<=2.447 then mem12=1;
mem13=0;if dist13<=2.447 then mem13=1;
mem14=0;if dist14<=2.447 then mem14=1;

data t5;set t4;
classx=min(dist1, dist2, dist3, dist4, dist5, dist7, dist8, dist10,
dist11, dist12, dist13, dist14);

proc means n sum;

var mem1 mem2 mem3 mem4 mem5 mem7 mem8 mem10 mem11 mem12 mem13 mem14;

data t6;set t5;index=0;
if (dist1=classx) and mem1=1 then index=1;
if (dist2=classx) and mem2=1 then index=2;
if (dist3=classx) and mem3=1 then index=3;
if (dist4=classx) and mem4=1 then index=4;
if (dist5=classx) and mem5=1 then index=5;
if (dist7=classx) and mem7=1 then index=7;
if (dist8=classx) and mem8=1 then index=8;
if (dist10=classx) and mem10=1 then index=10;
if (dist11=classx) and mem11=1 then index=11;
if (dist12=classx) and mem12=1 then index=12;
if (dist13=classx) and mem13=1 then index=13;
if (dist14=classx) and mem14=1 then index=14;

count=1;
proc sort;by index;
proc means n sum;by index;
var count;

data t7;set t6;
if index ne cluster;
title9 'Sections that were not classified in original cluster';
proc print;
run;

```

6d. SAS program to determine the Euclidean distance between each KC section and the centroids of clusters with a test of spherical (3CVs) population tolerance intervals.

```
/*sphere19.sas 4-22-99*/
/*Finalized COMP and LAYER tables were obtained from NRCS*/
/*in October 1997. Some of the data had been changed which*/
/*resulted in slight changes for averaged section soil data*/
/*Owing to the differences it was concluded that the vulnerability*/
/*analyses would have to be done again starting with the clustering*/
/*of soil data. Positive sections were determined as of 1-13-1999 and*/
/*for this analysis only DPR data for sections designated as PORN='N'*/
/*(Nonpoint source) and STATUS='P' was used. One section from a Ciba*/
/*was used. This program takes data which was spooled from Oracle tables*/
/*and averages variables where low and high values were determined*/
/*or assigns a numeric value to variables with descriptors such as*/
/*low, medium, and high. These data will be censored using*/
/*the slopeh <= 15% cutoff as determined from previous analyses*/

options ls=140 ps=45;
title1 'Cluster analysis of data from the Well Inventory as of:';
title2 'January 14, 1999 and NRCS tables as of April 22 1999';
title3 '1996 SOIL DATA CENSORED BY SLOPEH <= 15% AND WEIGHTED BY DEPTH';
title4 'Rainfall not used to remove sections';
title5 'Muids weighted by composition percentage';

data p;infile 'd:\epa\soiltest\cluster99\apr99\avg19out.dat' lrecl=141;
input cluster 1-2 mtrs $ 4-13 co 15-17 shrink1 19-22 .2 pan 24-27 .2
  perm1 29-33 .2 wattab 35-38 .2 no2001 40-45 .2 no401 47-52 .2 no101 54-59 .2
  no41 61-66 .2 clay1 68-73 .2 awc1 75-78 .2 inch31 80-85 .2 om1 87-90 .2
  no2002 92-97 .2 no402 99-104 .2 no101 106-111 .2 no41 113-118 .2 clay2 120-125 .2
  awc2 127-130 .2 inch32 131-136 .2 om2 138-141 .2;

data p1;set p;if cluster ne 17;
data p2;set p1;if cluster ne 19;
data p3;set p2;if cluster ne 16;
data p4;set p3;if cluster ne 9;
data p5;set p4;if cluster ne 15;
data p6;set p5;if cluster ne 18;
data p7;set p6;if cluster ne 6;
data p8;set p7;drop no401 no101 no41 clay1 awc1 inch31 om1 no2002 no402 no101
no41 clay2 awc2 inch32 om2;
title6 'Candisc on 12 of 19 clusters: shrink1 wattab perm1 pan- AVERAGE METHOD';
title7 'Means for raw data for 12 clusters and 4 variables';
title8 'Test of 3 Canonical variates at 12 clusters';

data t2;set p8;
cv1=0.9973*shrink1 + 9.8327*wattab - 4.7201*pan - 0.0076*perm1;
cv2=1.1001*shrink1 + 4.2927*wattab + 6.1866*pan - 0.5364*perm1;
cv3=-3.6400*shrink1 + 7.9581*wattab + 3.0601*pan + 0.1638*perm1;

data t3;set t2;
dist1=sqrt(((cv1-.4063)**2)+((cv2-(-3.5231))**2)+((cv3-1.989)**2));
dist2=sqrt(((cv1-6.1726)**2)+((cv2-3.5949)**2)+((cv3-0.2987)**2));
dist3=sqrt(((cv1-0.3509)**2)+((cv2-(-0.8134))**2)+((cv3-0.19605)**2));
dist4=sqrt(((cv1-(-1.588))**2)+((cv2-1.3412)**2)+((cv3-1.3438)**2));
dist5=sqrt(((cv1-(-3.959))**2)+((cv2-4.3127)**2)+((cv3-2.765)**2));
dist7=sqrt(((cv1-(-1.0159))**2)+((cv2-3.563)**2)+((cv3-(-2.3831))**2));
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dist8=sqrt(((cv1-(-2.7919))**2)+((cv2-5.1021)**2)+((cv3-0.0562)**2));
dist10=sqrt(((cv1-2.7102)**2)+((cv2-1.8638)**2)+((cv3-(-3.9565))**2));
dist11=sqrt(((cv1-9.3810)**2)+((cv2-3.9841)**2)+((cv3-4.7315)**2));
dist12=sqrt(((cv1-4.0805)**2)+((cv2-(-0.5121))**2)+((cv3-4.2213)**2));
dist13=sqrt(((cv1-9.9362)**2)+((cv2-5.065)**2)+((cv3-1.5089)**2));
dist14=sqrt(((cv1-7.6056)**2)+((cv2-7.6451)**2)+((cv3-4.273)**2));

data t4;set t3;if dist1 ne .;
mem1=0;if dist1<=2.795 then mem1=1;
mem2=0;if dist2<=2.795 then mem2=1;
mem3=0;if dist3<=2.795 then mem3=1;
mem4=0;if dist4<=2.795 then mem4=1;
mem5=0;if dist5<=2.795 then mem5=1;
mem7=0;if dist7<=2.795 then mem7=1;
mem8=0;if dist8<=2.795 then mem8=1;
mem10=0;if dist10<=2.795 then mem10=1;
mem11=0;if dist11<=2.795 then mem11=1;
mem12=0;if dist12<=2.795 then mem12=1;
mem13=0;if dist13<=2.795 then mem13=1;
mem14=0;if dist14<=2.795 then mem14=1;

data t5;set t4;
classx=min(dist1, dist2, dist3, dist4, dist5, dist7, dist8, dist10,
dist11, dist12, dist13, dist14);

proc means n sum;

var mem1 mem2 mem3 mem4 mem5 mem7 mem8 mem10 mem11 mem12 mem13 mem14;

data t6;set t5;index=0;
if (dist1=classx) and mem1=1 then index=1;
if (dist2=classx) and mem2=1 then index=2;
if (dist3=classx) and mem3=1 then index=3;
if (dist4=classx) and mem4=1 then index=4;
if (dist5=classx) and mem5=1 then index=5;
if (dist7=classx) and mem7=1 then index=7;
if (dist8=classx) and mem8=1 then index=8;
if (dist10=classx) and mem10=1 then index=10;
if (dist11=classx) and mem11=1 then index=11;
if (dist12=classx) and mem12=1 then index=12;
if (dist13=classx) and mem13=1 then index=13;
if (dist14=classx) and mem14=1 then index=14;

count=1;
proc sort;by index;
proc means n sum;by index;
var count;

data t7;set t6;
if index ne cluster;
title9 'Sections that were not classified in original cluster';
proc print;
data t8;set t6;if index=0;
title9 'Sections not classified into a cluster member';
proc print;
run;

```